UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

TEXAS CITIZENS UNITED FOR REHABILITATION OF ERRANTS, INC., ET AL	)	Docket No. A 23-CA-1004 RP
vs.	)	Austin, Texas
BOBBY LUMPKIN	)	April 7, 2026

TRANSCRIPT OF BENCH TRIAL
BEFORE THE HONORABLE ROBERT L. PITMAN
Volume 6 of 8

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I N D E X

Witnesses:	Direct	Cross	Redirect	Recross
Jane Leonardson	8	41		
Antonella Zanobetti	72	73		
Julie Skarha	73	73		
Anthony S. Cunningham	74	124		
Austin De La Cruz	156	213	263	

E X H I B I T S

	Offered	Admitted
Plaintiffs'		
(None)		
Defendant's		
#55	196	196
#91	157	157
#168	176	176
#170	187	188
#171	180	180
#173	181	181
#174	184	184
#175	190	190
#196	80	80
#205	71	71
#265	9	9

08:30:18 THE COURT: Good morning.

08:30:23 I think Ms. Golden may have told you and I
08:30:25 apologize in advance for any inconvenience, but tomorrow,
08:30:28 we're going to need to have a 9:30 start time rather than
08:30:32 8:30. And so, I hope that -- I know you've had an
08:30:36 out-of-country witness. Is that still going to be okay?

08:30:39 MR. JOHNSON: I think so. Yes, your Honor.
08:30:40 We've worked it out to where we have a carryover witness,
08:30:43 I think that we can go ahead and put him on. Get him on
08:30:48 and off.

08:30:48 THE COURT: Great. That's okay. But again,
08:30:50 thank you for your understanding of that. So again, we'll
08:30:53 start at 9:30 tomorrow rather than 8:30. So with that.
08:30:58 Yes.

08:30:58 MR. HOMIAK: Just one brief housekeeping matter.
08:31:01 The parties have conferred regarding the deposition
08:31:04 designations. I think -- the videos are now prepared.
08:31:05 Basically, what we've agreed is that defendants will play
08:31:09 their designation of Dr. Skarha. We'll then play our
08:31:16 designation of Dr. Skarha. They'll then play their
08:31:17 designation of Dr. Zanobetti, then we'll play ours. Just
08:31:19 so the Court knows what to expected.

08:31:20 Based on the clips we reviewed this morning, Dr.
08:31:26 Skarha's depositions are 30 minutes for the defendant, 24
08:31:29 minutes for us, so a total of just under an hour. And for

08:31:33 Dr. Zanobetti, 30 minutes for defendant, about
08:31:36 seven-and-a-half minutes for us. So roughly 37 minutes.
08:31:38 So I wanted to make sure that the Court is okay with the
08:31:40 timing presentation of that, and then, also, we've gone
08:31:44 ahead and removed the objections with the understanding
08:31:47 that neither side is waiving their objections by not
08:31:51 having the Court rule on them today, and then, the Court
08:31:53 basically can reserve ruling on those until you get a
08:31:56 chance to review our submissions.
08:31:56 I wanted to make sure that process is okay with
08:31:58 the Court.
08:31:58 THE COURT: No. That sounds reasonable. Mr.
08:31:59 Johnson, is that good with you?
08:32:01 MR. KERCHER: Yes, your Honor. That's our
08:32:02 understanding as well. Particularly, not only have we
08:32:05 removed things like objections but, also, particularly
08:32:09 with Dr. Zanobetti, there's some very long pauses, we
08:32:11 tried to cut those out as well as maybe some of my "ums"
08:32:16 to kind of move things along during court. We will be
08:32:19 supplying the Court with the full video because I do think
08:32:21 that some of those long pauses may bear on the Court's
08:32:24 determination of credibility. But rather than wasting
08:32:26 everybody's time in the courtroom, give the Court the
08:32:29 opportunity to review that on your own.
08:32:31 THE COURT: Okay. That sounds reasonable to me.

08:32:32 Can we cut the "ums" and the pauses out of the live
08:32:35 testimony, too?
08:32:38 MR. KERCHER: We're working on it.
08:32:40 MR. HOMIAK: And, your Honor, the only other
08:32:41 thing I would add is that if it would be helpful for the
08:32:44 Court, what we've done in other cases, I think has been
08:32:48 efficient and fairly easy for the Court to follow, is have
08:32:52 one essentially joint submission of the videos and then,
08:32:58 also, the transcripts where the -- essentially the
08:33:01 testimony from each side is highlighted in a certain color
08:33:06 and then, unobjected testimony -- or I should say, the
08:33:09 objected-to testimony from each side is highlighted in a
08:33:12 certain color where unobjected testimony is highlighted in
08:33:15 a different color, and the Court just then has one thing
08:33:18 to read essentially. Obviously, you watch the videos
08:33:21 side-by-side.
08:33:22 THE COURT: I think that sounds very efficient.
08:33:33 MR. HOMIAK: That's all I have this morning.
08:33:36 THE COURT: Let's pick up with your next witness.
08:33:39 MS. CARTER: Defendants call Dr. Jane Leonardson
08:33:43 to the stand.
08:33:52 THE COURT: All right. If you'd come forward,
08:33:55 ma'am.
08:34:03 Before you take a seat, could I get you to raise
08:34:06 your right hand to be sworn, please?

08:34:08 THE CLERK: You do solemnly swear or affirm that
08:34:08 the testimony which you may give in the case now before
08:34:08 the Court shall be the truth, the whole truth, and nothing
08:34:10 but the truth?
08:34:10 THE WITNESS: I do.
08:34:11 THE COURT: Thank you. Please be.
08:34:15 JANE LEONARDSON, called by the Defendant, duly sworn.
08:34:15 DIRECT EXAMINATION
08:34:17 BY MS. CARTER:
08:34:17 Q. Dr. Leonardson, good morning. Do you mind stating
08:34:20 your full name for the record?
08:34:21 A. Jane Leonardson.
08:34:23 Q. And, Dr. Leonardson, you testified at the preliminary
08:34:25 injunction hearing, correct?
08:34:27 A. Correct.
08:34:28 Q. So I don't want to be too duplicative, but I want to
08:34:31 remind Judge Pitman a little bit about your background.
08:34:33 Where is it you work?
08:34:34 A. I work halftime for University of Texas Medical
08:34:39 Branch, Correctional Managed Care, and the other half has
08:34:44 been consulting lately in the last few years.
08:34:46 Q. And what's your current title at the University of
08:34:51 Texas Medical Branch?
08:34:52 A. Director of Clinical Informatics.
08:34:55 Q. Are you a medical doctor?

08:34:57 A. I am.
08:34:57 Q. Brian, do you mind putting up Defendant's 265? Dr. Leonardson, is this a current version of your CV?
08:35:07
08:35:09 A. Yes.
08:35:10 Q. Where did you attend medical school?
08:35:14 A. Northwestern University.
08:35:19 Q. And your residency?
08:35:21 A. Also Northwestern University in internal medicine.
08:35:25 Q. Do you have any board certifications, Dr. Leonardson?
08:35:29 A. I've been board certified in internal medicine since either late '91 -- 1991 or maybe early '92. I can't remember when I took the boards the first time and I've been board certified in clinical informatics since 2016.
08:35:33
08:35:39
08:35:43
08:35:48 Q. Your Honor, at this time, I'd like to move to admit Dr. Leonardson's curriculum vitae as Exhibit 265.
08:35:52
08:35:58 THE COURT: Any objection?
08:35:58 MR. EDWARDS: No objection.
08:35:59 THE COURT: So admitted.
08:36:01 Q. (BY MS. CARTER) Dr. Leonardson, what is internal medication -- or internal medicine?
08:36:03
08:36:05 A. Internal medicine probably should be called adult medicine because it's confusing. It involves general adult medicine and it is also the general version of all of the subspecialties, including cardiology, infectious disease, pulmonology, gerontology, allergy. So all of
08:36:09
08:36:15
08:36:19
08:36:23

08:36:30 those people who do fellowships were first general
08:36:35 internal medicine physicians. So it's general adult
08:36:38 medicine.
08:36:39 Q. And what is clinical informatics?
08:36:44 A. Clinical informatics is a new specialty. Probably it
08:36:49 was not too long before I got board certified in it that
08:36:53 it was created and it's a lot of different things, but in
08:36:57 general, it is the management of medical or health data to
08:37:03 make it -- it's clinical, clinical data not so much like
08:37:10 numbers and things like that, but how do we make the data
08:37:14 accurate, available. How do we -- I do a lot with the
08:37:20 health record, some informaticists do coding and things
08:37:27 like that, but I don't. I do a lot of clinical management
08:37:31 of how do we use the data that we have, make sure it's
08:37:34 accurate, reportable, gets to the right people.
08:37:37 Q. Why is accurate reportable data important?
08:37:40 A. Well, it's really the only way you can take action in
08:37:44 a meaningful way. In the modern quality world, which I'm
08:37:51 also involved in, we've gone away from quality assurance
08:37:57 where you just like do check boxes and then, discipline
08:38:01 people and we've gone to what are our problems, how can we
08:38:06 address our problems, what's our baseline data, what
08:38:10 changes do we want to make and what is our data after the
08:38:13 change.
08:38:15 So you really have to have accurate data to know

what to do, to know if you're making a difference. It's a lot better to have good data to take care of patients. If you have accurate charting, you need to have good charting to keep your providers from getting burnt out. There's just a lot of applications for informatics in medicine.

Q. Is that the basis of your role at UTMB now?

A. Yes. I'm -- I was the Chief Medical Information Officer from 2016 to 2022 and I did probably most of my work was being the physician or clinical voice in the design of our electronic health record. And the reason that has arisen in medicine is because I don't know if you've all heard that there's a lot of burnout around electronic health records and some of that is because we have technical people who design them and they don't really know what providers need, how we think and how we look at things.

And so, when you're designing HR just like if you're going to design a dashboard of a car, you need to have the things you need to see in the right place. The buttons need to be big enough to press, you know, things like that where if you've ever noticed, it's called human engineering, some of it in your car. If you have a tiny little button that you press all the time, it's hard to hit. So I mean, just commonsense things like that.

But also, things like if you need to see the meds

08:39:57 to make some decision, then you need to have those
08:40:00 available at the top to see. So a lot of what I've done
08:40:04 is EHR design for clinical ease and also to make clinical
08:40:10 entry obvious so that the data that would get out the
08:40:13 other end is what we want. So not ambiguous language, you
08:40:20 know, things like that.
08:40:22 Q. Your Honor, at this time, I'd like to move to admit
08:40:24 Dr. Leonardson as an expert in internal medicine and
08:40:28 clinical informatics.
08:40:30 THE COURT: Objection?
08:40:31 MR. EDWARDS: No objection.
08:40:31 THE COURT: So designated.
08:40:35 Q. (BY MS. CARTER) Dr. Leonardson, where did you first
08:40:37 start your practice?
08:40:39 A. At the Cook County Jail in Chicago, I had a
08:40:47 scholarship from the Illinois Department of Public Health
08:40:50 that I needed to pay back, and so, I chose to do my
08:40:53 payback at the Cook County Jail.
08:40:55 Q. And how long were you there?
08:40:57 A. I was there two years.
08:40:59 Q. And were you treating patients?
08:41:00 A. Yes.
08:41:02 Q. Where did you go after the Cook County Jail?
08:41:06 A. I did what I thought I always wanted to do which is
08:41:11 to go into private practice in a college town. So I went

to Carle Clinic in Bloomington, Illinois and did not enjoy it nearly as much as corrections.

Q. When did you first start working at UTMB?

A. August of 1995.

Q. And, Dr. Leonardson, I think everyone in this room is familiar with UTMB as providing the medical care for inmates incarcerated at TDCJ. But from your impression, how does that relationship work?

A. It's really an ideal relationship in the sense that it's really win-win for everybody. Essentially, the University of Texas Medical Branch and Texas Tech are the vendors and other states have commercial vendors that are for profit.

And I can speak most for University of Texas because I work for them. So we have as primary care physicians out in the field seeing patients, I had -- and I don't see patients anymore but I had the opportunity to call up a specialist at UTMB if I had a question. I had the opportunity to refer my patients to, really, any specialty they needed at UTMB. I mean, it's just -- it's really -- it's better healthcare than a lot of people get and, you know, I -- you know, a lot of people need much better healthcare. So it's great in that sense that our patients get great healthcare.

It's also great for supporting the primary care

physicians in the field because, you know, you're not stuck out there going, I'm going to try to do my best but I don't have support. I mean, really, I could call someone up and go I've got this endocrine patient, what do you want me to order before I send them to you or what do you think?

And then, the other thing that's great about it is it keeps all of that contract money in state. It also supports all the residency programs at the universities. And in fact, over the years, there have been times where the university said we don't know if we want to do this anymore and we halted our referrals and they had to farm their residents out because a large portion of the interesting cases that they see are from the prison system. It's really a great -- like everybody wins.

Q. Dr. Leonardson, what was your first role at UTMB CMHC?

A. I was a staff physician at the Stiles Unit and at Pam much neither in August 95. And then I went solely to Pam Lychner which is was in Atascocita, Texas. I worked as a staff physician for a little while and then, I became the Medical Director there for most of my time there.

Q. And just to be clear for the Court, you worked in the units at these roles, correct?

A. I did. I did all the chronic care because that was a

08:44:29 specialized internist and I had PAs so they did a lot of
08:44:35 other things. But I did all the chronic clinic work.
08:44:41 Q. Dr. Leonardson, do you know if these units you worked
08:44:44 at were fully air-conditioned?
08:44:45 A. I do know they were not. The medical unit was
08:44:49 air-conditioned, most of the time, although we had one
08:44:51 summer where it was not, and the living areas were not
08:44:56 air-conditioned. They had giant ceiling fans. They were
08:45:02 pods.
08:45:03 Q. So you've provided care to inmates that have not
08:45:06 lived in air-conditioned housing?
08:45:07 A. I have.
08:45:07 Q. Dr. Leonardson, something else I noticed on your CV
08:45:15 is you've treated -- you were a lead physician in McMurdo
08:45:19 Station, Antarctica?
08:45:21 A. Yes.
08:45:21 Q. Can you explain what that role was?
08:45:23 A. Well, UTMB at the time ran the polar medicine program
08:45:27 and they put out a call for a physician position at
08:45:33 McMurdo Station in Antarctica and I kind of always wanted
08:45:38 to go and it was a five-week gig and the doctor that they
08:45:43 had there needed to be pulled out so I applied for it. It
08:45:50 was at a time in my career where I was switching from
08:45:52 being the Regional Medical Director to the CMIO so I went.
08:46:00 Q. So you were treating patients there in a totally

different climate than Texas, right?
A. Yes.
Q. And you mentioned this but when did you shift away from patient-facing roles?
A. In 2014, that was when I became the Chief Medical Information Officer and that was really kind of when I completely switched as a regional. Before that, I would see patients once in a while, fill in for providers who were on vacation or something. I was not mostly seeing patients during those years, but I did sometimes see patients.
Q. Prior to becoming CMIO, did you ever serve in a leadership role at UTMB?
A. While I was regional, a district physician when they had districts and then they reorganized to regions and I became a regional physician, regional leader. Over the years, I've always been kind of interested in being involved and I have been on multiple committees and served as a leader in that capacity.
Q. As a Regional Medical Director, how many units did you over see?
A. Twenty-five.
Q. Can you explain to the Court what region of Texas that was in?
A. It was the Houston region so it involves all -- I

08:47:29 mean, there's a lot of prisons in the Houston area all
08:47:33 down in Sugar Land and down on the coast and Beaumont and
08:47:39 as far north as Pack was in my region.
08:47:44 Q. And you mentioned the committees you've served on.
08:47:47 Which committees were those?
08:47:49 A. Well, some of the biggest committees were pharmacy
08:47:52 and therapeutics, mortality and morbidity, peer review,
08:47:58 policy and procedure. I was the chair of an ad hoc
08:48:04 committee on hepatitis C, the hepatitis C program. Just a
08:48:14 lot.
08:48:14 Q. You mentioned pharmacy and therapeutic committee,
08:48:18 correct?
08:48:18 A. Yes.
08:48:18 Q. What does that committee do?
08:48:20 A. Well, one of the biggest things they do is determine
08:48:23 the formulary. And if you don't know what a formulary is,
08:48:27 it's a preferred list of medication and some of that is,
08:48:33 you know, it's a preferred list because -- how do I
08:48:39 explain it? If you have -- we know we're going to treat
08:48:45 blood pressure and we know that people are going to need
08:48:47 to be on ace inhibitors, so our pharmacy is in charge of
08:48:54 creating a list of drugs that are preferred and meet
08:49:00 data-driven requirements so they would have an ace
08:49:03 inhibitor, but they've gotten a contract for a certain one
08:49:10 perhaps; and so, we're going to use that inhibitor, not a

08:49:14 different ace inhibitor if that makes sense.

08:49:17 Or sometimes new classes of drugs arise and we
08:49:20 need to add to the formulary. That's not uncommon either
08:49:25 and, you know, we have Pharm.Ds, a whole bunch of them
08:49:32 that are in charge of looking at what does the latest data
08:49:38 show, is this something that is better supported, is there
08:49:41 a better way to do things, and they report on it to us.
08:49:44 Q. The Pharm.Ds are members of the phototherapeutic
08:49:51 committee?
08:49:51 A. Yes, they make up the bulk of it.
08:49:54 Q. Are you still a member of any committees?
08:49:57 A. No. Well, I'm the chair of the joint EHR working
08:50:03 group, but I don't go to P&T or policy and procedure
08:50:07 anymore.
08:50:12 Q. How long have you been in the Director of Clinical
08:50:17 Informatics role?
08:50:18 A. I retired in 2022 and then, came back, I think it
08:50:25 was, in 2024, maybe 2023. I retired March of 2022. So
08:50:31 maybe it was 2023, I came back halftime.
08:50:35 Q. And who's your supervisor in this role?
08:50:38 A. Melanie Roberts. She is a Pharm.D, Doctorate in
08:50:43 Pharmacy.
08:50:44 Q. And do you work with other pharmacists in this role?
08:50:50 A. I have, yeah. I have contact with, really, anyone in
08:50:53 the pharmacy department if I have questions about drugs,

pharmacy.
Q. And do you work at all the pharmacist therapeutics group?
A. Not directly with the group but the people that are on the group.
Q. Okay.
A. If that makes sense.
Q. Dr. Leonardson, are you a programmer?
A. No.
Q. Are there programmers involved in your office?
A. There are, yes. There are tech people. They're kind of divvied into the front end and the back end of the EHR. The tech people are on the back end. But if I need something, I can call up the people I know from the tech side and say, here's what I'm hoping we can do. Can you do it? Or that's one of the functions I've had is being sort of the communicator between the clinical and the technical group.
Q. And you said the informatics group manages the electronic health record; is that right?
A. They manage the front end, the clinical part like what shows up when you look at the computer, that kind of thing. What do we need to show to pull a report, what are we actually looking for in a report, that kind of thing. They also do training and things like that.

08:52:17 Q. And so, what is your role in this?
08:52:20 A. Currently, I'm kind of an ad hoc person who has a
08:52:25 long history. I'm the only CMIO they've ever had and I'm
08:52:31 currently still the only physician voice on that group or
08:52:34 clinical voice, so I'm involved in various projects that
08:52:38 require -- right now, they're looking at automating sick
08:52:42 call requests or they're working on doing some more
08:52:48 automation on the referral process, things like that,
08:52:53 where they need a clinical voice. Or I also do
08:52:57 contribution over, historically, this is where we went and
08:53:01 this is where we ran into a problem. Sometimes that's,
08:53:05 you know, what I'm good for. And so, we used to do it
08:53:09 that way and that's the problem we had, so we need to not
08:53:11 go back to that or we need to make changes.
08:53:15 I have a lot of experience in things that both
08:53:18 went right and didn't work so well.
08:53:20 Q. And you mentioned automating the sick call process.
08:53:24 Why is that something you're considering?
08:53:26 A. Well, it helps us track -- whenever you have
08:53:31 something that's done manually, there's a risk of human
08:53:34 error and these are currently done on paper and submitted
08:53:39 in a sick call request box and they are -- there's a very
08:53:44 well-oiled system where they check the boxes, they stamp
08:53:48 them with date and time, and then, they are triaged by
08:53:53 nursing.

If they were automated, they could be entered on a computer, an iPad, or something by the patient, and then, we would have a faster turnaround because we'd have it right away. We would be able to track, which we're required to, the length of time that it takes us to do each step of the sick call process, according to NCCHC. We have, I'm sure you all know, rules about we need to do triage in a certain period of time and, you know, see patients in a certain period of time to ensure access to care. It also makes it clear in the chart, if you can imagine, a scanned, handwritten sick call request in the chart and then reviewing it. It's sometimes hard.

Q. Dr. Leonardson, your CV also mentions something called Lean Six Sigma.

A. Yeah. Lean Six Sigma is a -- it's kind of a modern quality philosophy and process. Actually, UTMB correctional managed care is very heavily involved in it and it's a really well-respected program for ensuring quality improvement and a lot of that -- and it started in cars, actually, you know, industry. But a lot of it in medicine is process improvement and, also, error proofing.

So if you can imagine, we look at -- the other thing about Lean Six Sigma is one of the philosophies is we assume that there will always be human error. We assume that if there's an error, we don't want to assume

08:55:51 that it is because that person is bad or not trained or
08:55:57 mal-intentioned. We assume that they are working under a
08:56:01 system that is not going to help them be successful.
08:56:06 So that's a huge cultural change for most places
08:56:12 and in that, you go in and you, without blame, are looking
08:56:17 at a process and being honest where there is a problem, a
08:56:24 gap, room for error, and then, looking at how you can
08:56:29 improve that process. And if you are defensive and not
08:56:33 willing to look at your own problems or measure your
08:56:37 before and after, it's very difficult to get better.
08:56:42 Q. And, Dr. Leonardson, it says that you're a black belt
08:56:46 in Lean Six Sigma. Can you explain what that
08:56:50 certification means?
08:56:50 A. Well, there are different belts. I told someone once
08:56:53 I was a black belt and they said is that an exercise? No,
08:56:55 it isn't exercise. It starts a yellow belt and a green
08:56:59 belt, and then, if you have extensive training in it and
08:57:04 you can even teach it if you're a black belt. I don't.
08:57:08 But it's good to understand all the concepts of it. And
08:57:12 UTMB has many black belts and they're overseeing about --
08:57:16 last I heard, it was about 65 Lean Six Sigma projects for
08:57:22 improvement. They have a very active quality department.
08:57:25 Q. Dr. Leonardson, do you not believe that heat can pose
08:57:38 a risk to someone's health?
08:57:39 A. I believe heat can.

08:57:45 Q. Why does the heat score exist, Dr. Leonardson?
08:57:49 A. Well, that has changed over the years. At first, I
08:57:53 was given a settlement from something -- and I know that
08:57:57 we talked about this before -- and told you need to help
08:58:01 TDCJ get a list of these patients that fall under these
08:58:05 conditions and it was somewhere around the Pack
08:58:09 settlement. I don't know if it was the Pack settlement
08:58:12 exactly, but it was like we want to put people with heart
08:58:17 disease in cool beds. Only they said people with
08:58:21 atherosclerosis, people with coronary artery disease,
08:58:25 people with coronary -- a lot of the same thing. And so,
08:58:29 there was a big list of different groups of patients that
08:58:32 they wanted to house in cool areas. And of course, the
08:58:38 security side of the house doesn't have access to the EHR.
08:58:43 They wouldn't know what they were looking for if they did
08:58:46 so we have to help them know who those patients are.
08:58:51 So we built a way for them to know and the best
08:58:57 we could do at the time was -- well, it's not the best.
08:59:04 It was the only thing we could do is if you -- is we pull
08:59:07 out the actual charting on a patient. It's just normal
08:59:13 charting just like when we all go to the doctor and we
08:59:17 pull out all of that data that we can out the back end and
08:59:22 we cannot send diagnoses to security because of HIPAA. So
08:59:30 at the time, security did not have enough beds to house
08:59:36 all those people in a cool area.

08:59:39 So what they needed was a priority list so we
08:59:43 created a scoring system so that if you're going to -- you
08:59:49 would get a point for one problem and another point for
08:59:52 another problem. So they at the time housed the people
08:59:55 with the highest point score first, and then, they worked
09:00:00 their way down the list of numbers. And I think, at
09:00:05 first, it started with everyone who has nine or higher
09:00:09 gets a cool bed, and very quickly, it became everyone
09:00:14 who's got a positive score is in a cool bed.
09:00:23 The problem here is that physicians don't know
09:00:26 anything about the settlement. They aren't really taught
09:00:30 about -- a lot about who should live in heat and who
09:00:37 should not live in heat and it's not something where we
09:00:41 can train them all. So we want them to actually just see
09:00:45 patients and we want to be able to pull what we need out
09:00:51 the back and not make our providers really involved in
09:00:56 deciding something that they are not very familiar with.
09:01:01 Q. Dr. Leonardson, what changes have been made to the
09:01:05 heat score since that consideration?
09:01:07 A. Initially, it was really just a settlement and here
09:01:11 you go and help us pull this out and we weren't really
09:01:14 involved in any kind of action to make it better. But
09:01:19 very quickly, one of the things that we knew was that we
09:01:23 had drugs on our formulary that, probably, we needed to
09:01:27 take off. So formulary changes were made where like

09:01:31 tricyclic antidepressants were taken off because they're
09:01:35 anticholinergic and they were replaced with safer
09:01:39 antidepressants.
09:01:42 So we had that. We also -- it sort of morphed
09:01:48 into this is not just around the Pack settlement, but we
09:01:50 need to start looking at this for everybody and there was
09:01:54 more involvement in how do we progress our program. We
09:02:03 originally had our intake heat score on paper where
09:02:09 somebody tallied it up, which is not a great system for
09:02:12 many reasons. But we did not have our intake system
09:02:18 automated in the electronic health record so we couldn't
09:02:21 do the heat score for the intake. We call it the
09:02:25 backdoor.
09:02:26 So since then, we have automated our intake
09:02:30 system so that we can automatic our heat score for intake
09:02:35 and change it every time drugs change at intake. We have
09:02:42 added myasthenia gravis and multiple sclerosis, which are
09:02:48 actually taught to us in med school as things that are
09:02:51 affected by heat. Those were not on the original list.
09:03:00 We have since added everyone over 65. A year ago, this
09:03:05 year, we added all anticholinergic medication patients
09:03:11 four days or more.
09:03:14 Q. Dr. Leonardson, you mentioned tricyclic that you took
09:03:18 that off. Was that taken off the heat score or taken off
09:03:21 the formulary?

09:03:22 A. Taken off the formulary, yeah, because it was used
09:03:28 for depression and it's a highly anticholinergic and so,
09:03:32 we have other options that are better.
09:03:35 Q. So tricyclic isn't even prescribed to patients
09:03:39 anymore; is that correct?
09:03:40 A. If it is, it's rare; and if it is, it's on the heat
09:03:44 score because it's an anticholinergic, highly active.
09:03:46 Q. And, Dr. Leonardson, you mentioned the back end. Can
09:03:53 you tell me what an ICD code is?
09:03:57 A. ICD, I can't remember what it stands for and there
09:04:01 are different versions around ICD10. It's a list of
09:04:07 diagnosis codes and in the free world, it was invented for
09:04:11 coding for billing. There are like 72,000 codes in ICD10
09:04:19 and we do not in the prison system need 72,000 codes so we
09:04:25 don't present 72,000 codes to everybody. We've kind of
09:04:30 got it less granular because we don't need that for
09:04:34 billing. If someone has a broken arm, we don't need to
09:04:36 know right or left on the problem list, for instance,
09:04:39 because we don't need to bill for it.
09:04:43 So I don't know how many problems -- ICD codes we
09:04:48 present on our problem list, several thousand, but we use
09:04:52 them for creating a problem list and also for pulling data
09:04:58 that's coded about problems. If I want to know about
09:05:03 diabetics, I have to first identify the diabetics and I
09:05:07 would do that by using the problem list, the codes.

09:05:11 Q. Dr. Leonardson, you mentioned the back end. How is a
09:05:15 heat score generated?
09:05:17 A. Well, the patients are seen by providers or nurses or
09:05:22 anybody and we do charting in the electronic health record
09:05:26 just like a normal doctor's office and we go about our
09:05:32 business, and hopefully, we don't slow people down trying
09:05:37 to worry about doing things that aren't natural in the
09:05:42 healthcare environment. So we want people to fill out the
09:05:45 problem list to order meds, to order labs, to take care of
09:05:49 the patient.
09:05:52 And then, in the back end, we have this algorithm
09:05:56 and there's one for intake and there's one for the people
09:06:00 that have at least had their intake physical, which is on
09:06:04 day three. And what that does is, for instance, if you
09:06:12 have heart disease, you'll get a point and that's on the
09:06:16 algorithm. But heart disease, that point might represent
09:06:23 40 ICD codes that have been plugged in there so that if
09:06:29 the patient has one of those ICD codes, we can pull it out
09:06:33 and go, this patient has a point.
09:06:38 Q. Dr. Leonardson, why are there different
09:06:40 considerations for the intake heat score and the at-hand
09:06:47 score?
09:06:47 A. Well, first of all, at the intake, intake is where
09:06:51 patients come from county to the state system so they may
09:06:56 have been in county in less than a couple of weeks. They

09:06:59 could be in withdrawal. We don't know everything about
09:07:03 them. They are not acclimated. We don't have a full set,
09:07:07 a full chart. We don't know as much about them and so, we
09:07:12 cannot use the same data points because they're not there.
09:07:16 So we have to use what we have at intake and a
09:07:21 lot of that is patient reporting or the -- there's a
09:07:26 transfer sheet from the county jail. But, you know, you
09:07:30 gotta be careful because everything might not be on there
09:07:33 so we kind of err on the side of caution for the intake
09:07:36 patients because we don't know them as well and they may
09:07:40 not be as acclimated.
09:07:44 Q. Brian, do you mind putting up Defendant's 205? Dr.
09:07:50 Leonardson, have you seen this document before?
09:07:52 A. Yes.
09:07:53 Q. And, your Honor, this has already been admitted into
09:07:56 evidence as Defendant's 205.
09:07:58 Dr. Leonardson, does this represent as best as
09:08:01 possible the algorithm or, as you've called it, the back
09:08:03 end to generate a preliminary score?
09:08:07 A. It does. It's an algorithm that we pull from the
09:08:10 back end so...
09:08:14 Q. But as you've said, no one is going in and checking
09:08:17 that core section on the right column, right?
09:08:19 A. Correct. And we don't have providers saying -- like
09:08:21 filling out a form or anything.

09:08:24 Q. And, Brian, do you mind going to 206? Dr.
09:08:29 Leonardson, have you seen this document?
09:08:33 A. Yes.
09:08:33 Q. And, your Honor, this has already been admitted as
09:08:36 Defendant's 206.
09:08:38 Does this represent as best as possible the
09:08:41 algorithm used to generate a final score or as what's
09:08:43 commonly referred to as an at-hand score?
09:08:46 A. Yes. And it's not final, ever.
09:08:49 Q. What do you mean by that?
09:08:51 A. It changes. Every time I see a patient or, you know,
09:08:55 a patient is seen and their meds change, or they turn 65,
09:09:01 or they get a new diagnosis, or something changes for that
09:09:04 patient, it updates several times a day. So it's not like
09:09:11 we saw you, you're done, you know, you're here 18 years,
09:09:15 you're going to have the same heat score. I mean, it
09:09:18 changes all the time. It reassesses every day.
09:09:22 Q. This score highlights some different criteria than
09:09:26 the preliminary score, right?
09:09:28 A. Say that again please.
09:09:29 Q. This, score, some of the conditions are different
09:09:32 than the preliminary score; is that right?
09:09:35 A. Yes.
09:09:37 Q. So, for example, on the left side of your screen, you
09:09:42 have under positive screening, inability to advocate or

09:09:45 care for oneself, inability to understand the heat
09:09:49 mitigation measures, severe suboptimal intelligence,
09:09:53 suspected intellectually impaired or dementia. Do you see
09:09:56 that?
09:09:56 A. I do.
09:09:57 Q. Who is making these determinations?
09:10:00 A. Well, this is based -- the one on the left, the
09:10:04 intake one is based on a nursing assessment at the
09:10:08 backdoor. The nurses aren't filling this out either like
09:10:12 this. They're doing their basic assessment of the patient
09:10:17 at intake and part of that is to explain the heat
09:10:21 mitigation measures. And what we're looking for both on
09:10:25 the positive screening one for intake and the cognition
09:10:29 one are patients who really are unable to advocate for
09:10:32 themselves with the heat -- well, for anything but
09:10:38 especially with the heat mitigation measures. We don't
09:10:41 have a mental health assessment at the intake area.
09:10:48 So if a nurse is seeing a patient who does not
09:10:50 understand what is going on, they have the opportunity to
09:10:55 say this patient needs, you know, special attention
09:10:58 because they're potentially not being -- going to be able
09:11:03 to advocate for themselves.
09:11:06 Q. You said that patients aren't receiving a mental
09:11:10 health evaluation at the backdoor, at intake; is that
09:11:12 correct?

09:11:12 A. They do not too long after that but not right at
09:11:19 arrival.
09:11:21 Q. Dr. Leonardson, the intake score also notes BMI of 40
09:11:26 or higher. Do you see that?
09:11:27 A. Yes.
09:11:28 Q. And that is not like the at-hand score that has an
09:11:31 age requirement of over 65; is that correct?
09:11:34 A. Correct.
09:11:35 Q. Why is that?
09:11:37 A. Because there's potential for lack of acclimatization
09:11:44 for people coming in new from a county jail.
09:11:52 Q. Dr. Leonardson, when a treating provider on the unit
09:11:55 is reviewing a record or evaluating a patient, would they
09:11:59 see this back end?
09:12:00 A. No.
09:12:02 Q. Why?
09:12:05 A. The back end, maybe I haven't been clear. The back
09:12:07 end is like a bunch of tables, like a bunch of
09:12:10 spreadsheets and a computer with data like if I enter the
09:12:15 weight that goes to a table on the back end and we can
09:12:18 pull out of it but -- so that the people taking care of
09:12:21 patients, they're not experts in this and they're not
09:12:26 experts in the litigation and they're not -- so we just
09:12:31 want them taking care of patients and filling in the chart
09:12:34 the way they've been taught and they have expertise in.

09:12:38 And so, they do not see the heat score that is sent to
09:12:44 TDCJ in the electronic health record.
09:12:48 Q. And so, when you say that's sent to TDCJ, how does
09:12:51 that happen?
09:12:52 A. Well, we send a message to their Offender Management
09:12:57 System, it's called. It's the computer system they use to
09:13:01 keep track of all the inmates and their custody levels.
09:13:07 And I'm not an expert on that system either, but you know,
09:13:13 my part sort of ends in sending them what they need to do
09:13:16 their job.
09:13:16 Q. And the system's interfaced? Is that accurate to
09:13:23 say?
09:13:23 A. Yes.
09:13:23 Q. And, Dr. Leonardson, you've already said this, but
09:13:32 there have been substantial changes to the heat score
09:13:34 system. Is that fair to say?
09:13:36 A. Yes.
09:13:37 Q. Have changes been made since the preliminary
09:13:39 injunction hearing in 2024?
09:13:41 A. Yes.
09:13:42 Q. And what were those changes?
09:13:47 A. We added age without any other health condition, age
09:13:53 65 and up and 75 and up. We also added patients that are
09:14:04 on any highly active anticholinergic drug for four days or
09:14:09 more. Previous to that, we kind of used the psychiatric

09:14:16 diagnoses as a proxy, but there are situations where
09:14:20 highly anticholinergic drugs can be used in a
09:14:24 nonpsychiatric situation. And this is also one of the
09:14:27 situations that we learn about in med school as highly
09:14:32 active anticholinergic drugs can predispose to heat
09:14:37 intolerance.
09:14:37 Q. Dr. Leonardson, how is the criteria that triggers a
09:14:42 score determined?
09:14:46 A. Well, originally, like I said, it was just a
09:14:49 settlement that was put in front of us and, you know,
09:14:51 here, do this, and since then, it has become more of a
09:14:55 group effort for the entire system to -- we've involved
09:15:03 pharmacy heavily. We have Pharm.Ds who are really the
09:15:07 people who are telling us this is an anticholinergic drug,
09:15:11 this is not.
09:15:14 I now have -- one of the contacts I've had with
09:15:16 pharmacy lately is to request a review of all of our
09:15:22 medications on formulary for verification that we're
09:15:25 collecting everything in the heat score and that none of
09:15:28 our medications are -- preferred medications on the
09:15:31 formulary have changed. So we have heavy involvement of
09:15:36 pharmacy.
09:15:36 We have physicians from both sectors, the UTMB
09:15:42 sector, Texas Tech sector. We have people involved, the
09:15:49 healthcare people on the TDCJ side. And we also have now

09:15:55 regular meetings with TDCJ leadership about how to best
09:15:59 coordinate getting the right people into the cool beds
09:16:02 that we have.
09:16:06 Q. Dr. Leonardson, I want to ask you about the sheet.
09:16:09 When it says anticholinergic, is that an actual medication
09:16:13 name on formulary?
09:16:15 A. No. It is a -- it's kind of like a set of side
09:16:19 effects. It's not even a set class. It's a bunch of
09:16:25 drugs have side effects that are anticholinergic so it is
09:16:28 a whole huge group of drugs that have anticholinergic side
09:16:33 effects. There's a cholinergic receptor. But, you know,
09:16:39 the pharmacologists, I think you have one, they can be
09:16:41 more specific to a physician, it's drugs that are drying,
09:16:45 sedating, things like that.
09:16:54 Q. Why do some of these points have different values?
09:16:58 Like, for example, there's a separate point for being 75
09:17:01 and above and you'd still get another point for being 65
09:17:04 and above.
09:17:05 A. Well, and going back to the original situation where
09:17:08 we had a score, we had a score because we did not have
09:17:13 enough beds that were cooled and rapidly, you know, cool
09:17:18 beds came online. But at the time, we needed a weighted
09:17:25 situation so that TDCJ could know who had the highest
09:17:28 score and start there.
09:17:30 If we had had enough beds where we could say yes,

09:17:34 no, then it wouldn't matter. So we have just left it as a
09:17:39 score so those 2s that are on this one, for instance,
09:17:43 those are more heavily weighted, and currently, that
09:17:46 doesn't matter because we have everybody with a positive
09:17:49 score in a cool bed. But if we were to ever go to a
09:17:54 situation where we don't have enough cool beds again, then
09:17:57 we would need it to be weighted so that we could know who
09:18:01 to put in first. We haven't taken anything away as we've
09:18:07 added things.
09:18:09 Q. And, Dr. Leonardson, are individuals at higher risk
09:18:13 where some of these combinations might be or conditions
09:18:17 might be combined?
09:18:18 A. I'm no heat expert, honestly, but that makes sense to
09:18:22 me and what I have read, yes.
09:18:23 Q. And when you say you're not a heat expert, you do
09:18:29 have people on your team who are thinking about these
09:18:31 interactions with heat. Is that accurate to say?
09:18:34 A. The pharmacy people, the Pharm.Ds are experts,
09:18:37 really, on what are highly active anticholinergics and
09:18:40 what drugs may predispose to heat injury. And the rest of
09:18:46 us are physicians and interested parties who've, you know,
09:18:53 done reading and it's an unusual feel because there isn't
09:18:58 really a specialty in heat and it's kind of unique to
09:19:04 prison or maybe homelessness.
09:19:09 Q. Dr. Leonardson, if a provider on the unit may believe

09:19:13 that a patient could have a bad physical outcome due to
09:19:17 heat but they aren't in air-conditioned housing. Is there
09:19:20 a mechanism for them to recommend that?
09:19:22 A. Yes. And actually. It is different than what I
09:19:25 thought at the preliminary injunction. When I was
09:19:30 retired. I think this change happened and I was not
09:19:35 aware. So if a physician on the unit says. I've got this
09:19:39 patient that. For whatever reason. They are really not
09:19:43 doing well --
09:19:44 MR. EDWARDS: Your Honor. I'd have to object.
09:19:46 Hearsay.
09:19:46 THE COURT: Say it again. Objection --
09:19:48 MR. EDWARDS: I'm objecting to the hearsay. This
09:19:49 is based on what people told her.
09:19:52 MS. CARTER: Your Honor, she's testified that
09:19:53 there is a different way preretirement and now she's still
09:19:58 involved in this postretirement. She can testify to what
09:20:00 she knows to be true of her analogy.
09:20:02 MR. EDWARDS: Problem is she doesn't know it to
09:20:05 be true.
09:20:05 THE COURT: It's hearsay. If there's no
09:20:07 exception, it sounds to me hearsay. Sustain the
09:20:10 objection.
09:20:12 Q. (BY MS. CARTER) Dr. Leonardson, are you aware of a
09:20:21 Health Services Liaison?

09:20:22 A. Yes.
09:20:23 Q. And what do they do?
09:20:26 A. They it says -- they're the liaison between Health
09:20:33 Services and TDCJ so if a patient needs to be moved to a
09:20:37 cool bed, they facilitate that and that's the patients
09:20:47 that aren't -- that do not have a heat score.
09:21:01 Q. Dr. Leonardson, what do you mean about the new
09:21:04 process?
09:21:04 A. I know that a provider on a facility requests a cool
09:21:09 bed for a patient by notifying the Chief Medical Officer
09:21:14 of their sector. The Chief Medical Officer reviews the
09:21:19 case, decides whether a cool bed is warranted, and then,
09:21:24 that person notifies Health Services Liaison, who then
09:21:32 facilitates the movement.
09:21:40 Q. Dr. Leonardson, are you aware of the quality review
09:21:43 group?
09:21:45 A. Yes.
09:21:48 Q. Do they have any role in the heat score system?
09:21:56 A. No.
09:21:57 Q. Do they have any role in ensuring inmates are housed
09:22:00 in air-conditioned housing?
09:22:02 A. No.
09:22:02 Q. Do they capture instances of heat illness and injury?
09:22:08 A. Yes.
09:22:09 Q. And how do you interact with them?

09:22:13 A. I don't. I know of them. I know what they do
09:22:16 because it's a gap in what we do. We cannot capture very
09:22:21 well the patients that have heat injury as soon as they
09:22:27 come back from the hospital because nursing sees them and
09:22:32 they do not enter problems on the problem list. But we
09:22:37 want to capture those patients immediately on return from
09:22:41 any kind of a hospitalization so that they can get housed
09:22:46 in a cool area.
09:22:49 So the utilization review group, it took me a
09:22:52 second to realize which group you were talking about. The
09:22:55 utilization review group transmits that information for
09:22:59 reporting to the quality reporting group, who shares it
09:23:04 with Health Services Liaison, who then gets these patients
09:23:07 housed.
09:23:13 Q. And, Dr. Leonardson, you said that that's a gap in
09:23:16 the system. What do you mean by that?
09:23:17 A. It's not really -- it's hard to consistently have
09:23:22 that reported all the time, 100 percent of the time in the
09:23:26 electronic health record at the time that it happens
09:23:30 because it happens, you know, and nursing sends them off
09:23:35 or they come back from a hospital, of course, the hospital
09:23:40 is not on our EHR, so the patient comes back, maybe they
09:23:45 have minimum paperwork with them. But the people that
09:23:49 keep track of what's going on in the hospital are
09:23:51 utilization review so they will know if this patient had a

09:23:56 heat injury and went to the hospital.
09:23:58 Q. And that's operating outside of the heat score
09:24:01 system.
09:24:01 A. It is because we don't have a good data point to
09:24:05 pull.
09:24:07 Q. Dr. Leonardson, why do you want to identify those
09:24:10 inmates who may have suffered a heat illness before?
09:24:13 A. Because we think that it's safer to house them,
09:24:16 again, in a cool area because they have shown that they
09:24:24 are prone to heat injury.
09:24:25 Q. Dr. Leonardson, were you in the courtroom when Mr.
09:24:28 Fitzpatrick was asked questions about specific inmates
09:24:31 with heat illness?
09:24:32 A. I don't think I was.
09:24:35 Q. Would you consider heat rash a heat illness?
09:24:38 A. I would not consider it a heat injury.
09:24:43 Q. Why?
09:24:44 A. It is not a systemic problem. It's not even really a
09:24:49 medical term. It's like plugged-up sweat glands from
09:24:56 rubbing on cloth, it's not dangerous, it's annoying, it's
09:25:05 itchy.
09:25:05 Q. Dr. Leonardson, do you believe anyone at UTMB or TDCJ
09:25:10 are intentionally discounting instances of heat illness or
09:25:15 injury?
09:25:15 A. No.

09:25:16 Q. Do you consider it a priority to accurately
09:25:20 accommodate those most at risk?
09:25:20 A. Yes.
09:25:21 Q. Do you believe TDCJ wants that, too?
09:25:23 A. Yes.
09:25:25 Q. Dr. Leonardson, why have you stayed in correctional
09:25:29 medicine your entire career?
09:25:32 A. Well, it's very interesting medicine. It's kind of
09:25:36 an intersection between politics and medicine and public
09:25:41 health. I really like public health. I feel like I am a
09:25:45 person that can take care of people at any station in
09:25:51 life. I like the teaching aspects of correctional
09:25:55 medicine. I think that I do good. I help things. It's
09:26:02 gratifying.
09:26:04 Q. And, Dr. Leonardson, what are you and the people you
09:26:08 work with going to be do moving forward?
09:26:12 A. Well, as far as the heat score and housing people in
09:26:16 cooler areas as TDCJ adds -- brings cool beds online, our
09:26:23 plan is to gradually move new groups of patients into
09:26:29 those cool beds and I think we're looking at diabetics
09:26:34 next, and then, probably, we'd be looking at hypertension
09:26:38 as the next group after that. Diabetics incorporates a
09:26:43 lot of hypertenses. Many diabetics are hypertensive and,
09:26:49 also, probably a more delicate group.
09:26:56 Q. Dr. Leonardson, based on your training and experience

working in correctional medicine, do you believe that the purpose of the score system and the subsequent additions intend to identify the inmates most at risk for heat injury and illness?

A. Yes.

Q. I pass the witness, your Honor.

MR. EDWARDS: Just one moment, Dr. Leonardson.

CROSS-EXAMINATION

BY MR. EDWARDS:

Q. Good morning. My name is Jeff Edwards. We met previously, I guess, downstairs for two seconds. I didn't realize who you were. And then, I don't know if you recall, but I asked you some questions at the prior preliminary injunction but it was over Zoom, correct?

A. Correct.

Q. When we had that -- when we talked last, you were unaware that people over 65 were at a higher risk of -- from the extreme heat; is that correct?

A. Yes. I am not the heat expert.

Q. Well, you're board certified in internal medicine. You made a real big point to the Court to say there's no literature that supports someone being -- 65 being a greater risk. That's what I recall. Do you recall that differently?

A. I don't recall that, honestly.

09:29:07 Q. Okay. Well, I guess the transcript will speak for itself. Do I have this right, following the preliminary injunction hearing, you made the change to add people over 65?

09:29:23 A. Yes.

09:29:25 Q. And you also made one other -- that's the only kind of -- well, that's one of the changes. And then, I believe you testified that another change was you added some medications?

09:29:40 A. Yes.

09:29:41 Q. What medications did you add?

09:29:44 A. The medications considered highly active anticholinergic.

09:29:48 Q. Okay. There's been testimony in the court that there's no such thing as highly active anticholinergic. They're just cholinergic medications. Do you disagree with that?

09:30:02 A. I would defer to the Pharm.D, the pharmacy specialists tell us there is.

09:30:09 Q. Okay. You don't know, fair?

09:30:12 A. Fair. I ask the specialists.

09:30:14 Q. Okay. Do you consider a toxicologist a specialist?

09:30:20 A. I don't know.

09:30:21 Q. Okay. You don't know, you don't know. As you

09:30:24 testify here today, can you tell us what TDCJ considers

09:30:30 highly active anticholinergics that are on its scoring
09:30:34 system?
09:30:34 A. It's anticholinergic.
09:30:37 Q. I may get it wrong every time and I apologize.
09:30:40 A. It's okay.
09:30:41 Q. Anticholer --
09:30:43 A. Cholinergic.
09:30:43 Q. Anticholinergic. I'll do my best with that. Can you
09:30:49 tell me what drugs they are?
09:30:52 A. Well, there are hundreds.
09:30:54 Q. Hundreds. Okay.
09:30:55 A. Maybe. Maybe a hundred. There are hundreds of drugs
09:31:00 that are -- they're not all on our formulary but on our
09:31:05 back end list of anti -- highly active anticholinergics, I
09:31:11 can't tell you the exact number but there are many drugs
09:31:14 that have these properties.
09:31:18 Q. Are all beta blockers?
09:31:21 A. They are not anticholinergics.
09:31:23 Q. Okay. What about SSRIs?
09:31:27 A. They are not considered highly active
09:31:30 anticholinergics according to our --
09:31:35 Q. What about --
09:31:36 A. -- Ph.D. pharmacists.
09:31:39 Q. What about calcium channel blockers?
09:31:41 A. They are also not.

09:31:45 Q. What about antipsychotics?
09:31:47 A. Many are.
09:31:49 Q. And some aren't?
09:31:50 A. Some are not considered highly active
09:31:53 anticholinergics, but we capture everyone on them.
09:31:57 Q. Well, that's my question.
09:31:59 A. In a different way.
09:32:01 Q. You capture them in a different way. I guess, don't
09:32:08 let me go away from that, but as you testified here today,
09:32:12 all antipsychotics are not considered highly active
09:32:16 anticholinergic?
09:32:18 A. Well, you know, what I should say, you should ask the
09:32:21 Pharm.Ds. My understanding as an internist is first
09:32:27 generation antipsychotics are highly active
09:32:33 anticholinergics. Often, the drugs we use with
09:32:35 antipsychotics often are and the second generation drugs
09:32:41 are less so.
09:32:43 Q. What about antihistamines?
09:32:46 A. First generation are highly active.
09:32:48 Q. Benadryl?
09:32:49 A. That's first generation, yes.
09:32:51 Q. So it ought to be captured?
09:32:53 A. Yes.
09:32:55 Q. Diuretics?
09:33:00 A. Not highly active anticholinergics.

09:33:09 Q. Did I hear you right, you're getting to considering
09:33:13 whether diabetes should be a category that's protected
09:33:18 with air conditioning?
09:33:20 A. I believe diabetes will be our next group that is
09:33:25 automatically housed. Right now, it's diabetics over 65
09:33:30 or diabetics who have heart disease or kidney disease.
09:33:36 Q. That is a gaping hole in your medical vulnerability
09:33:45 chart currently, right?
09:33:47 A. Repeat, please?
09:33:48 Q. That is a gaping hole in your whatever you want to
09:33:52 call this, this scoring system currently, right, that
09:33:56 diabetics under the age of 65 are not considered by TDCJ
09:34:02 to have a heat score?
09:34:03 A. I wouldn't describe it as a gaping hole. I would
09:34:06 describe it as a risk that's prob -- all of medicine is
09:34:10 risk, assessing risk. So that is probably the next
09:34:14 highest at-risk group to be addressed. Yes.
09:34:17 Q. All right. Diabetes is not currently on your heat
09:34:22 scoring system, correct, for people under 65 without organ
09:34:26 damage?
09:34:26 A. Right.
09:34:27 Q. People with COPD under the age of 65, that's not
09:34:31 currently on your list?
09:34:32 A. No.
09:34:33 Q. People with asthma under the age of 65, that's not

09:34:36 currently under your list?
09:34:37 A. No.
09:34:37 Q. People with asthma -- people with hypertension,
09:34:41 that's not currently on your list?
09:34:43 A. No.
09:34:45 Q. People with anxiety, that's not currently on your
09:34:47 list?
09:34:48 A. No.
09:34:49 Q. People suffering depression, that's not currently on
09:34:52 your list?
09:34:53 A. No.
09:34:59 Q. If I take my phone out -- people with obesity over a
09:35:05 body mass index of 30, that's not on your list anywhere,
09:35:08 is it?
09:35:09 A. I'd have to look again. I think it's on the intake.
09:35:13 Is it on the intake one? I'd have to look.
09:35:15 Q. You're here to testify. Is it on the -- is BMI over
09:35:21 30, which is the definition of obesity, on your heat
09:35:25 scoring system?
09:35:25 A. I would have to look.
09:35:27 Q. Okay. Let's pull up Plaintiffs' Exhibit 326 -- I'm
09:35:34 sorry, 329. I'll represent to you that that is the
09:35:52 current list. Do you see anywhere on this BMI over 30?
09:35:59 A. No.
09:36:02 Q. Do you see anywhere obesity?

09:36:06 A. Other than over 65, no.
09:36:13 Q. You're aware that obesity is a condition that renders
09:36:16 you more vulnerable in the heat, aren't you?
09:36:18 A. Yes.
09:36:19 Q. That is another gap in the system that's currently in
09:36:25 place, correct?
09:36:28 A. It's another risk.
09:36:31 Q. Well, the point -- fair to say the point of any
09:36:38 system you develop is to identify risk in order to protect
09:36:43 inmates in potential danger?
09:36:45 A. Correct.
09:36:47 Q. And the goal of any system ought to be to actually
09:36:50 protect inmates who are at risk of danger?
09:36:54 A. Yes.
09:36:55 Q. I mean, that's what the Sigma philosophy's all about,
09:36:58 right?
09:36:59 A. It's about reducing risk. A lot of it.
09:37:17 Q. What information do you need to add diabetes to your
09:37:26 heat score system? Why isn't it done right now, today?
09:37:30 A. Because we cannot house them until the new beds are
09:37:34 online and there's a plan to bring these beds online.
09:37:36 Q. So the system is partly designed because of a lack of
09:37:43 air-conditioned space, right?
09:37:45 A. Right.
09:37:46 Q. So if you added hypertension, there's a lot of people

09:37:49 with hypertension in the system, isn't there?
09:37:51 A. Right.
09:37:52 Q. There's a lot of people with BMIs over 30 at risk in
09:37:55 the system, isn't there?
09:37:56 A. Yes.
09:37:56 Q. There's not enough beds to protect those people so
09:38:00 they're not on your heat score list, right?
09:38:04 A. I guess, partly.
09:38:13 Q. Do you know how many people do have the medical
09:38:20 conditions that UTMB and CMHCC have identified as making
09:38:27 you medically vulnerable?
09:38:30 A. I don't know how you're defining that.
09:38:33 Q. Okay. Paul, would you put up the interrogatory,
09:38:37 please? We asked Director Collier to identify inmates
09:39:15 with these conditions. Over 65 years of age, body mass
09:39:19 index of 30 or higher, diagnosed with asthma, diagnosed
09:39:22 with COPD, diagnosed with cirrhosis of the liver,
09:39:26 diagnosed with obesity, diagnosed with hypertension, all
09:39:30 on down with the various drugs that UTMB or CMHC has
09:39:36 identified as drugs that may affect heat tolerance, okay?
09:39:49 And this has been updated as of June 4, 2024, okay? It
09:39:53 wasn't updated by TDCJ. But as of June 4, 2024, it was a
09:39:59 hundred-thousand and 853 people. Did I read that
09:40:02 correctly?
09:40:03 A. Yes, you read it correctly.

09:40:07 Q. That's a hundred-thousand people in the system that
09:40:11 have conditions or take medications which may impact them
09:40:18 negatively in the heat, right?
09:40:22 A. I don't know that I completely agree that -- I mean,
09:40:25 my learning about asthma is that most of them are not
09:40:28 sensitive to heat. And in fact, I trained in a cold
09:40:34 climate and that cold causes more bronchospasm. There may
09:40:40 be some that are. I would also point out if you scroll
09:40:43 back up, there are a lot of these conditions --
09:40:46 Q. Let's scroll back up for the doctor. And I just want
09:40:48 to be clear, this is as of May 2025 so the record's clear.
09:40:51 A. Okay.
09:40:55 Q. You were going to make a point.
09:40:58 A. I know we talked about this at the injunction is that
09:41:02 in the practice of medicine -- and I've actually asked
09:41:08 people that are training now because in that time of
09:41:11 climate change, maybe things have changed -- people don't
09:41:15 ensure that their patients are going home to air
09:41:20 conditioning. Asthma is a whole like spectrum and so are
09:41:28 COPD, so is cirrhosis and...
09:41:36 Q. Are you a heat expert or are you not a heat expert?
09:41:39 I'm confused. You said earlier you weren't.
09:41:41 A. I don't know what makes you a heat expert other than
09:41:44 reading articles and I'm as much of a heat expert as any
09:41:48 internist. I'll say that.

09:41:50 Q. Okay.
09:41:51 A. Because we're not trained that these are really
09:41:55 treated differently. There are a few things we learn are
09:41:59 affected by heat and a lot of these are not on that list.
09:42:03 Q. All right. I'm just -- this list comes from your
09:42:07 documents but that's neither here nor there. Your
09:42:10 testimony to the Court is that people with asthma don't
09:42:14 suffer more in the heat. That's your testimony?
09:42:17 A. The teaching and medical school.
09:42:19 Q. No --
09:42:20 A. That is the teaching in medical school.
09:42:22 Q. That's how you were taught in medical school?
09:42:24 A. Bronchospasm is more common in cold air.
09:42:27 Q. But that's not what we're talking about. We're
09:42:30 talking about suffering in the heat --
09:42:31 A. Are you talking about comfort --
09:42:33 Q. -- and there's been --
09:42:33 MS. CARTER: Your Honor, I just ask that Dr.
09:42:34 Leonardson be able to finish her answer.
09:42:36 THE COURT: Yeah, if you'd not talk over each
09:42:38 other.
09:42:38 MR. EDWARDS: Yeah. No. I apologize.
09:42:39 A. I mean, if we're talking about asthma exacerbation,
09:42:42 that is a bronchospastic condition, and generally, it's
09:42:46 considered to be worse in cold. Now, can it be worse in

heat? Maybe someone's allergic to something. I never would say never. The other thing is asthma can just be exercise-induced asthma. And I can tell you, you got this list almost certainly from my group because Mr. Collier does not have access to this list other than asking us how many patients do we have with asthma.

Q. (BY MR. EDWARDS) Okay.

A. That's where it has to have come from.

Q. I just want to be clear. You disagree with the testimony in this court that people who suffer from asthma are impacted negatively to heat. Yes or no.

A. I don't want to say yes or no. I would say sometimes maybe. I don't think that's typical.

Q. Okay. And do you disagree with the expert testimony in this court that people with COPD are affected and at greater risk in the heat?

A. I don't know. I've not ever learned that.

Q. Are you now willing to acknowledge that people with diabetes are, in fact, at greater risk in the heat?

A. I'm not quite sure how to take what there is. We know that there's an association. We know that there's a disproportionate number of diabetics in heat injury groups, but you cannot tell out of the diabetics who is going to have the problem. However, in prison since people cannot choose where they're housed, it makes sense

09:44:21 to house the diabetics.
09:44:27 Q. If it makes sense to house the diabetics in air
09:44:33 conditioning because of the increased danger to them
09:44:37 health-wise, you would tell this court that all diabetics
09:44:42 ought to be housed in air conditioning, correct?
09:44:46 A. I would say that it behooves us to do it because we
09:44:49 cannot tell which ones are going to have a problem and
09:44:56 there does appear to be a disproportionate number in the
09:45:03 heat injury groups.
09:45:11 Q. Were you provided the Court's order in this case, Dr.
09:45:17 Leonardson?
09:45:19 A. I don't know what that even means.
09:45:23 Q. I'm sorry?
09:45:24 A. I don't know what you mean by that.
09:45:26 Q. Were you provided the Court's order on the
09:45:32 preliminary injunction? The Court, Judge Pitman, issued
09:45:36 an order in which he described the heat score. Were you
09:45:40 provided it?
09:45:43 A. I don't know what that is so I guess not, or if I
09:45:49 was, I read it so long ago that...
09:45:53 Q. Okay. He found the system when you last testified to
09:45:56 be arbitrary, inadequate and ineffective.
09:45:59 A. Yes, I did read that.
09:46:03 Q. And the change you made was to add people 65 and to
09:46:09 add some medications that you can't actually tell me what

09:46:12 they are.
09:46:14 A. It's a whole big group. I can't list them off the
09:46:17 top of my head. I think what has come of this is that
09:46:22 there's an effective plan to move forward and to bring
09:46:26 cool beds online and fill them with risk groups.
09:46:30 Q. There ought to be a plan to do that.
09:46:32 A. There is.
09:46:32 Q. Whether there is or isn't, can we all agree that a
09:46:36 hundred percent, there ought to be one?
09:46:38 A. There should be a plan.
09:46:41 Q. A plan to air condition the system, right?
09:46:47 A. Well, it's not a simple question. Is it important to
09:46:54 air condition the entire system? I mean, I think that you
09:46:58 could look at there's risk across the system in lots of
09:47:05 places. So if you are going to use your allotted budget
09:47:11 to cool beds for people who don't have increased risk, is
09:47:16 it better to do that or a different project? But right
09:47:19 now, I believe that TDCJ is planning on cooling the entire
09:47:25 system.
09:47:27 Q. When do you understand they will have the entire
09:47:29 system cooled? Because you're testifying under oath that
09:47:32 there's a plan.
09:47:33 A. The plan I've heard is that we have like 17,000 beds
09:47:37 coming on next year and I just learned yesterday that
09:47:40 there's a plan for more going forward. I haven't needed

09:47:45 to concern myself with it because once they have beds
09:47:48 online, then I do.
09:47:50 Q. It sounds like you do need to concern yourself with
09:47:53 it because in order to get the people with diabetes into
09:47:55 air conditioning, you need to know how much space is there
09:47:58 before you put that on the heat score list, right?
09:48:00 A. 17,000 beds will do that.
09:48:03 Q. Okay. So now that you have -- your understanding is
09:48:06 now that you have 17,000 more beds, then you'll add
09:48:10 diabetes?
09:48:10 A. Yes.
09:48:10 Q. Okay. And how many people have hypertension in the
09:48:14 system?
09:48:15 A. About 50,000, they think.
09:48:18 Q. So until you get another 50,000 beds, you're not
09:48:22 going to put hypertension on the list of conditions that
09:48:25 get a heat score?
09:48:26 A. No. But hypertension is caught up in almost
09:48:31 everybody that has heart disease and we already catch
09:48:37 them. It's caught up with everybody with diabetes. It's
09:48:40 50 percent of everyone over 50 so it's caught up in almost
09:48:45 everyone over 65 and so, we're already catching a large
09:48:49 percentage of them.
09:48:50 Q. But you don't know the exact numbers, do you?
09:48:52 A. I haven't had them pulled in that way.

09:48:55 Q. And you know that there are people -- there's a lot
09:48:59 of people under 65 with hypertension.
09:49:02 A. Yes. Fifty percent of people over 50. Half the --
09:49:05 well, maybe not half because a lot of young people but a
09:49:07 lot of us have hypertension.
09:49:08 Q. Can you testify here today that all antipsychotic
09:49:22 medications are on your heat score list?
09:49:23 A. I don't know that. But everybody who has
09:49:29 schizophrenia, schizoaffective disorder are on there and
09:49:33 that is who was on those drugs.
09:49:38 Q. Let's go back up to -- could you pull up Exhibit --
09:49:43 the current 2026 heat score, please? If you look at
09:50:40 schizoaffective disorder, it requires you to have an HAAC,
09:50:45 right?
09:50:47 A. Right.
09:50:49 Q. So unless you consider it an antipsychotic and HAAC,
09:50:55 it doesn't capture it, right?
09:50:56 A. If they're in a second generation and they're not on
09:51:00 a accompanying either Cogentin or Benadryl, which
09:51:05 counteracts some of the side effects, then they are not on
09:51:08 an HAAC.
09:51:10 Q. Is there a document which lists out what you consider
09:51:13 the HAACs?
09:51:15 A. Yes.
09:51:20 Q. And who controls that? Does TDCJ have access to that

document?
A. No.
Q. All right.
A. It's the list of what pulls out of the back end of the computer.
Q. Do you know what the word "arbitrary" means?
A. Yes.
Q. What does it mean?
A. Random without reason.
Q. And what does the word "ineffective" mean?
A. Without effect.
Q. And what does the word "inadequate" mean?
A. Not adequate.
Q. And did the people making modifications to the heat score recently know that a court had found this heat score inadequate and arbitrary and ineffective?
A. Yes.
Q. Did the people do an analysis of all the people who had died to determine conditions they have?
A. No. We are not in the business of research. We follow the data that we have.
Q. Well, isn't that valuable data for you to consider when designing a system to protect the vulnerable?
A. You can't really look at N equals 1. Every single death is --

09:52:39 Q. I'm sorry. I apologize. I don't mean to interrupt
09:52:43 you. You can't look at something equals 1 and I just
09:52:46 didn't hear you. I'm sorry.
09:52:47 A. N.
09:52:48 Q. N. Okay.
09:52:48 A. Yes. Every single death is looked at to see -- this
09:52:52 is in mortality and morbidity committee.
09:52:55 Q. Sure.
09:52:55 A. Every single death is looked at to see if something
09:52:58 should have been done differently, if there is a gap that
09:53:01 we have, is there a problem with the provider where they
09:53:05 need counseling or even need to be fired. Is there a
09:53:09 problem with our system where we need to change and then,
09:53:13 if there is, those get reported to us. I get asked pretty
09:53:17 regularly if the heat score is working properly and I take
09:53:22 patient charts that they're concerned about and look and
09:53:26 it has not been not working properly.
09:53:28 Q. My question -- let me object as nonresponsive just to
09:53:33 be clear. I say that respectfully.
09:53:35 My question was have you looked at the deaths in
09:53:39 order to determine whether or not the conditions those
09:53:42 people suffered from are covered by a heat score?
09:53:46 A. No.
09:53:47 Q. Okay. And you made a comment like that's not data we
09:53:51 should be looking at. Did I hear you correctly?

09:53:53 A. You can't statistically look at that and decide that
09:53:58 is -- they're individual patients. You can look and see
09:54:05 if your process is not working, but you have to have a
09:54:09 large number of people to decide yes.
09:54:14 Q. Has TDCJ ever done such a study of its inmate
09:54:19 population?
09:54:20 A. That's a research study and they are not a research
09:54:24 entity.
09:54:24 Q. Does TDCJ have the wherewithal or the ability to ask
09:54:29 someone to do such a study?
09:54:33 A. You know, I can't speak to it. They are not a
09:54:36 research entity and whatever heat literature is out there
09:54:42 is out there for everybody.
09:54:45 Q. And the key to the heat literature being out there
09:54:48 for everybody from a policy standpoint is actually reading
09:54:53 it and implementing it into your policies.
09:54:57 A. The problem --
09:54:58 Q. Do you agree with that before you go much more on
09:55:01 that?
09:55:01 A. Implementing it after you read it critically.
09:55:05 Q. I agree with that.
09:55:07 A. Like we talked about before, it's difficult to
09:55:13 interpret it and it is not considered -- it's not taught
09:55:18 to physicians that you should make sure hypertensives are
09:55:22 housed in air conditioning, for instance, so does that

09:55:25 mean they shouldn't? Does that not mean that maybe it's
09:55:28 coming? Maybe it is. But I think that if you look at the
09:55:32 literature, it's difficult to know how to address it. And
09:55:38 in prison, I guess the way to address it is to take
09:55:43 everyone who has a risk and house them in air conditioning
09:55:47 and that has been planned.
09:55:51 Q. And I appreciate -- that's your -- you've been
09:55:55 told --
09:55:55 A. And the 19,000-bed mark that was mentioned yesterday
09:56:00 will cover pretty much all of them.
09:56:01 Q. And you mentioned you're a consultant?
09:56:04 A. Yes.
09:56:04 Q. Are you being paid?
09:56:05 A. I'm not consulting.
09:56:06 Q. You're not consulting here. You do other consulting.
09:56:10 You've been told by TDCJ, hey, we're going to air
09:56:14 condition everything, eventually?
09:56:16 A. I heard it yesterday in court.
09:56:17 Q. Oh, okay. Just from what you've heard in court. You
09:56:20 haven't --
09:56:20 A. What I've been told by TDCJ is we will have 17,000
09:56:23 more beds online next year.
09:56:37 Q. All right. And I don't mean to belabor this because
09:56:57 I think you've told me no so I'll move away from this.
09:57:00 But you can't tell me the names of the highly active

anticholinergic prescriptions that get inmate scores, right?
A. It's a spreadsheet that's about 20 pages long.
Q. Okay.
A. And it's also a list that was developed by a -- you know, Pharm.Ds.
Q. All right. So benztropine, you don't know?
A. It is.
Q. Oh, it is?
A. Yes. Benadryl's on there for sure.
Q. Benadryl is on there?
A. Yes. All of the highly active anticholinergics.
Q. Was Benadryl on there in 2023?
A. I don't think we had anticholinergics as a distinct list so people who were on it at that time in the system were the people that were on antipsychotics and they needed Benadryl to counteract the side effects of those.
Q. Okay. I guess my question is anything -- that was well-known five, 10 years ago, right?
A. Right. And we were catching them because in our system, those are used with psyche drugs, and since then, some of that has changed because the psyche drugs have progressed and they are now less anticholinergic. So there is perhaps less use of Cogentin and Benadryl to counteract those. But now we've added this other category

09:58:40 so we're going to catch anyone who's on it for anything.
09:58:45 Q. And my only point is just like the age 65
09:58:50 requirement, that's been known for decades, right?
09:58:52 A. It's not taught in med school.
09:58:55 Q. Okay. My question is, why did you add it?
09:59:02 A. I was not on the meeting where that was decided but
09:59:07 the --
09:59:07 Q. Do you know why they added it?
09:59:09 A. Pardon me?
09:59:10 Q. Do you know why you added it?
09:59:12 A. I was asked to add it so we added it.
09:59:14 Q. Who told you to add it?
09:59:15 A. You know, I don't remember. I have thought about
09:59:18 that. I can't remember who asked me.
09:59:20 Q. Do you think it had anything to do with the fact that
09:59:27 you were asked about it in this testimony in court?
09:59:31 A. I'd be speculating.
09:59:36 Q. But you don't know who told you to add it?
09:59:38 A. I don't.
09:59:39 Q. And you don't know why you were told to add it?
09:59:41 A. It was decided that this was the next phase of it.
09:59:45 Q. And you just know that you were -- that that decision
09:59:48 got made after you were asked about it and told that all
09:59:53 of the medical literature was replete with that risk
09:59:56 factor. True, right?

09:59:59 A. It was after the injunction.
10:00:12 Q. Would you put back the interrogatory of a
10:00:15 hundred-thousand people? How many people currently have a
10:00:20 heat score, Dr. Leonardson if you know?
10:00:27 A. I don't know exactly.
10:00:31 Q. I'll represent to you that there's been testimony
10:00:34 somewhere between 15,000 and 19,000.
10:00:37 A. Uh-huh.
10:00:37 Q. Does that sound right or do you have no idea?
10:00:39 A. Well, I mean, it sounds right. Is that before or
10:00:42 after we added the highly active anticholinergics?
10:00:46 Q. It's the most recent numbers we've been provided and
10:00:49 I will represent that, that it's current.
10:00:52 A. All right.
10:00:54 Q. You would agree that let's say the high number of
10:00:57 19,000 is not even remotely close to a hundred thousand,
10:01:01 correct?
10:01:01 A. Correct.
10:01:05 Q. You mentioned that you have the ability to contact --
10:01:19 one of the benefits working at UTMB is you can contact
10:01:23 specialists in care, right?
10:01:25 A. Yes.
10:01:26 Q. And that would mean that you can consult
10:01:32 pulmonologists as to whether or not COPD is actually
10:01:36 impacted by the heat, right?

10:01:38 A. I don't see patients anymore but theoretically.
10:01:41 Q. You can pick up the phone and call a pulmonologist,
10:01:44 can't you?
10:01:45 A. I could.
10:01:45 Q. Are there pulmonologists on this committee that's
10:01:49 determining this heat score system?
10:01:50 A. No.
10:01:52 Q. Are there cardiologists?
10:01:54 A. No. There are physician leaders, they're general
10:01:59 internists.
10:01:59 Q. Are there toxicologists?
10:02:01 A. Pharmacologists, pharmacy Ph.D.s, Pharm.Ds.
10:02:05 Q. And yourself, right?
10:02:08 A. Right.
10:02:08 Q. Anybody else?
10:02:09 A. Yes. We have the leader physicians from UTMB,
10:02:14 Correctional Managed Care, Texas Tech and TDCJ.
10:02:18 Q. Generalists, right?
10:02:20 A. Right.
10:02:21 Q. No specialists?
10:02:22 A. Correct.
10:02:28 Q. No endocrinologists?
10:02:31 A. No.
10:02:32 Q. Paul, would you put up Defendant's 138, please, which
10:02:47 is the HSL. I don't want to belabor this because I think

10:02:53 you told me that it's your belief that providers can go
10:02:58 out of their way to recommend air-conditioned housing if
10:03:02 they think it's urgent or needed?
10:03:04 A. Yes.
10:03:05 Q. And you said that that program has to go through the
10:03:09 Health Services Liaison, right?
10:03:13 A. Yes. It doesn't go the same route as I thought.
10:03:19 Q. That's fine. I just want to make it clear every
10:03:25 doctor fills out a housing form which can restrict an
10:03:32 inmate's housing or work experience, right?
10:03:36 A. I don't know if housing is --
10:03:38 Q. Let's call it HSM18.
10:03:40 A. Right. I know that. It's work restrictions. The
10:03:44 housing -- I see what you're saying here. Well, they can
10:03:46 do, you know, single level --
10:03:50 Q. Right. We talked about this at the last session.
10:03:52 A. Right. Gotcha.
10:03:53 Q. And again, you can say you can't have a top bunk, you
10:03:59 need a bottom bunk, it can impact housing as a medical
10:04:02 provider and there's a form that those providers are
10:04:05 given, right?
10:04:05 A. It's a, yeah, a field in a computer.
10:04:09 Q. Right. It's a form they fill out and it's a field in
10:04:12 a computer. One of those is no temperature extremes which
10:04:15 is a work criteria, right?

10:04:17 A. Right.
10:04:20 Q. There is nothing on that form that says no
10:04:25 non-air-conditioned housing, correct?
10:04:27 A. That is correct.
10:04:29 Q. If TDCJ wanted it to be on there for all of the
10:04:32 providers to get to say whether or not they believe this
10:04:35 person should have air-conditioned housing, they could put
10:04:38 it on there, but that's a choice they made not to,
10:04:41 correct?
10:04:42 A. I don't know. It's never been on there.
10:04:44 Q. It's never been on there. You don't know why it's
10:04:47 not on there.
10:04:47 A. I don't know why it's not on there.
10:04:49 Q. It would be a much easier process if you really cared
10:04:52 about giving providers the ability to weigh in
10:04:56 air-conditioned housing versus non air-conditioned housing
10:04:58 for their medical benefit to put it on that form, right?
10:05:03 A. The problem is it would be a personal opinion like,
10:05:07 oh, everyone should live in air conditioning.
10:05:10 Q. Isn't that --
10:05:10 A. That would not be based on medical learning. It's
10:05:15 just not taught in med school even now. No one teaches
10:05:23 you these patients should live in a cool environment.
10:05:27 Nobody.
10:05:29 Q. Is there a course called how to house people in

10:05:34 extreme temperatures in the Texas prison system that's
10:05:36 suddenly become a --
10:05:38 A. No, there is not. We are taught in regular medical
10:05:40 schools there's no teaching that COPDers should live in
10:05:45 cool housing. There's no teaching that any of these.
10:05:48 They do teach us that myasthenia gravis and MS gets worse
10:05:53 in heat and they teach that people that are on highly
10:05:57 active anticholinergics are more prone to heat injury, but
10:06:01 regular medical school and residencies do not teach it.
10:06:05 Q. All right. Let me get back to my initial question
10:06:08 I'm sorry. I probably steered you that way. Could you go
10:06:11 to page 2, Paul? This is the current policy relating to
10:06:20 the Health Services Liaison. And I understand you're
10:06:25 testifying somewhat differently but the current policy
10:06:27 still says -- and just I want to direct you to the second
10:06:33 paragraph there. It says air-conditioned climate control
10:06:35 facilities. Do you see it?
10:06:36 A. Yes.
10:06:37 Q. I'm just going to read it okay. Some facilities have
10:06:41 housing areas with air condition being temperate air
10:06:44 climate control. Not all inmates meet the security
10:06:47 criteria to be in the climate-controlled cells, dorms on
10:06:50 the facility. HSL, which stands for Health Services
10:06:54 Liason, cannot request reassignment of an inmate to an
10:06:58 air-conditioned or climate controlled facility.

10:07:00 Did I read that correctly?
10:07:01 A. Yes.
10:07:02 Q. All obese people ought to be in air conditioning for
10:07:14 their health benefits, correct?
10:07:18 A. I don't know. I'm not -- I have not been taught that
10:07:21 in medical school.
10:07:21 Q. The expert on thermoregulation for the state
10:07:27 testified to that effect. Do you disagree with that or do
10:07:29 you just not know?
10:07:30 A. I just don't know. That is not my area of expertise.
10:07:35 Q. And here's my concern. If you're the one involved
10:07:39 with the heat score and it's not your area of expertise to
10:07:47 determine who should be getting these heat scores, why are
10:07:50 you involved in the heat score process?
10:07:52 A. My job is to make sure that we get the information
10:07:55 that is accurate to the right place so it can be acted
10:08:00 upon. And as far as determining what's on the heat score,
10:08:05 I am not in charge of it. I am part of a large group
10:08:10 that --
10:08:11 Q. You're just one piece of the --
10:08:13 A. I am one piece but my biggest piece is making sure
10:08:17 that we are getting information from the source to the
10:08:22 people who need it to act on it.
10:08:25 Q. Back to remember I was talking about that HSM18, that
10:08:34 housing form?

10:08:35 A. Yes.
10:08:35 Q. That you're familiar with. If TDCJ or UTMB or Texas
10:08:44 Tech trump -- I mean, wouldn't it be better to put a
10:08:48 housing recommendation AC, not AC on that form if you
10:08:54 trust your unit-level providers to do their jobs
10:08:57 competently?
10:08:58 A. They're not trained to do that. That's what I'm
10:09:00 saying is that providers are not trained. They even now
10:09:05 in climate change, I think there's more recognition that
10:09:08 we need to look at it, but there's still not training that
10:09:11 says diabetics should live in air conditioning so I don't
10:09:16 think that you can expect it to be accurate.
10:09:20 Q. And that basis for that is you weren't trained in med
10:09:27 school and you're not aware that med schools train whether
10:09:33 or not to recommend prisons -- that prisoners be housed in
10:09:36 air conditioning rather than not air conditioning. That's
10:09:38 the training basis for that?
10:09:40 A. Training in med school doesn't even really involve
10:09:44 prisoners. It involves patients and prisoners are
10:09:46 patients just like everybody else so there's this unusual
10:09:50 situation. And it also exists in the free world that
10:09:54 people don't have air conditioning or people are unhoused
10:09:58 and don't -- that are living outside. And I mean, I've
10:10:03 done a very informal poll about current medical school and
10:10:08 residency training.

10:10:10 Q. It just strikes me as a bit absurd, Doctor, that
10:10:15 you're basing this on medical school. Are there courses
10:10:17 in medical school about whether or not to assign a top
10:10:20 bunk or a lower bunk in prison?
10:10:22 A. No.
10:10:23 Q. Are there courses in medical school to assign, you
10:10:32 know, don't work in the laundry? Is that a course in
10:10:37 medical school?
10:10:38 A. No, but that's also not a restriction. I mean, you
10:10:42 have to -- and this is part of my job is knowing what
10:10:45 people know so you're not asking them to fill out
10:10:48 something they don't know.
10:10:50 Q. Everybody knows that air conditioning or cooler
10:10:54 temperatures have a protective effect in terms of human
10:10:57 health, though, right?
10:10:58 A. Everyone knows that it's comfortable. I don't think
10:11:02 -- yes.
10:11:03 Q. We're way past that in this case, you understand
10:11:05 that, right, ma'am?
10:11:06 A. Well, I understand that you say we are and some of
10:11:08 the lists you show are sort of presented as this is how it
10:11:12 is and I think that there's some nuance to some of it that
10:11:17 is not being acknowledged. I mean, it's hard to go
10:11:26 through it all in a courtroom and go, well, all cirrhotics
10:11:32 are not the same, all -- you know, all these people are

10:11:34 not the same.

10:11:36 The other thing is there is a set plan to get
10:11:40 people in cool areas and it is just not something that can
10:11:47 happen overnight. I do have confidence that it is being
10:11:52 done in an expedient way. I have confidence that we're
10:11:55 going to get our most delicate people in cool air as soon
10:12:01 as possible, and that to say they should be there now
10:12:04 doesn't help because we have the people that are most at
10:12:08 risk in it now.

10:12:12 Q. People are still dying while you wait. You
10:12:25 understand that, don't you, Doctor?

10:12:29 A. I have not heard of definite heat deaths but I am not
10:12:33 on mortality and morbidity.

10:12:37 Q. Well, this court --

10:12:38 A. I know there is risk.

10:12:42 Q. There's an elevated risk of death as a consequence of
10:12:45 being in extreme heat. You understand that, don't you?

10:12:49 A. I understand.

10:12:56 Q. I believe you testified in the prior preliminary
10:13:16 injunction that you think the people that have medical
10:13:18 conditions that put them at higher risk of living in a hot
10:13:21 environment should be moved to a cooler environment,
10:13:24 right?

10:13:25 A. Yes.

10:13:36 Q. And we're just going to wait until TDCJ builds the

10:13:39 beds necessary before we put those people who are obese,
10:13:43 hypertensive and diabetic into that cool environment,
10:13:46 right?
10:13:50 A. That's our only choice.
10:13:53 Q. Thank you.
10:13:59 MS. CARTER: No redirect, your Honor.
10:14:00 THE COURT: Thank you, Doctor.
10:14:01 MS. CARTER: Before I do go off the record, I was
10:14:04 told that I did not move to admit 205 --
10:14:07 MR. EDWARDS: No objection, your Honor.
10:14:08 MS. CARTER: -- that's the intake score.
10:14:09 THE COURT: So admitted.
10:14:10 MS. CARTER: Thank you, Dr. Leonardson.
10:14:12 THE COURT: All right. Your next witness?
10:14:13 MR. KERCHER: Your Honor, at this point, we're
10:14:26 going to play the deposition testimony of Dr. Zanobetti
10:14:29 from whom the Court heard remotely at the preliminary
10:14:32 injunction. As I've described, we tried to cut down on
10:14:36 some of this stuff. In real time, this would be 45
10:14:41 minutes, but because we cut down on these pauses, it's
10:14:44 about 30.
10:14:45 THE COURT: Great.
10:14:46 MR. KERCHER: As I say, when the Court gets time,
10:14:48 I've got the full video if the Court would like it.
10:14:53 Seeing those, I think, will make a difference.

10:15:07 THE COURT: Got it. Mr. Kercher, there's no need for the court reporter to take this testimony down, is there?

10:15:10 MR. KERCHER: No, your Honor. We have both the video and the transcript.

10:15:13 THE COURT: Great. Thank you.

10:15:15 (Audio and video file played.)

10:15:45 THE COURT: Mr. Kercher, have we gone to the unedited version?

10:44:49 MR. KERCHER: I'm sorry, your Honor. This appears to be a place where we missed --

10:44:52 THE COURT: That's fine. I just wanted an estimate because we're going to have to take a break.

10:44:55 MR. KERCHER: We've got five minutes left.

10:44:58 THE COURT: Okay. Great.

10:45:01 (Audio and video file played.)

10:45:04 MR. KERCHER: Your Honor, maybe cut down on the silence, if we take our break now, we can fast-forward and figure when we get the answer to this question. If counsel doesn't mind interrupting between question and answer.

10:45:06 THE COURT: I think that's great. We're a little overdue for our break so we'll take a 20-minute break now. We'll be back at, let's say, 11:10. A little bit longer, 11:10.

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10:47:02 (Recess.)

11:12:09 MR. KERCHER: We're ready to proceed, your Honor.

11:12:11 THE COURT: Great.

11:12:12 (Audio and video file played.)

11:15:33 MR. KERCHER: Your Honor, that concludes our
11:15:35 deposition designations from Dr. Zanobetti and I
11:15:37 understand the plaintiffs are now going to play theirs.

11:15:39 THE COURT: Very good.

11:15:43 MR. HOMIAK: Yes, your Honor. This is about
11:15:45 seven minutes or less.

11:15:54 (Audio and video file played.)

11:24:00 MR. HOMIAK: Your Honor, that concludes our
11:24:01 portion of Dr. Zanobetti's deposition designations.

11:24:05 MR. KERCHER: Defense will now play portions of
11:24:07 Dr. Skarha's deposition.

11:24:09 THE COURT: Thank you.

11:24:12 (Audio and video file played.)

11:55:50 MR. KERCHER: This concludes our designations,
11:55:51 your Honor.

11:55:52 THE COURT: Thank you.

11:55:52 MR. HOMIAK: Just so the Court knows what to
11:55:58 expect, we're a little bit shorter at 20 to 25 minutes.

11:56:01 THE COURT: Thank you.

11:56:17 (Audio and video file played.)

12:20:43 MR. HOMIAK: Your Honor, that concludes

plaintiffs' designated portions of Dr. Skarha's testimony.

THE COURT: Thank you. Your next witness?

MR. MICKLE: Your Honor, at this time, defendant calls Dr. Scott Cunningham.

THE COURT: Before you take a seat, could you raise your right hand to be sworn, please?

THE CLERK: You do solemnly swear or affirm that the testimony which you may give in the case now before the Court shall be the truth, the whole truth, and nothing but the truth?

THE WITNESS: Yes.

THE COURT: Please be seated.

ANTHONY S. CUNNINGHAM, called by the Defendant, duly sworn.

DIRECT EXAMINATION

BY MR. MICKLE:

Q. Good afternoon, sir. How are you?

A. Good.

Q. Would you state your full name for the record, please?

A. Anthony Scott Cunningham.

Q. And, sir, what is your current profession?

A. Visiting Professor of Formal Theory Methods at Harvard and Ben H. Williams Professor of Economics at Baylor University.

12:21:58 Q. Mr. Christopher, would you please pull up Defendant's
12:22:04 Exhibit 196, please? Dr. Cunningham, I'm showing you here
12:22:09 what's been marked as Defendant's Exhibit 196. Do you
12:22:12 recognize this document?
12:22:13 A. Yes.
12:22:13 Q. What is this, sir?
12:22:14 A. This is my vitae.
12:22:16 Q. Would you describe to us your educational background?
12:22:21 A. I have a Bachelor's of Literature or Bachelor's in
12:22:25 Literature at the University of Tennessee, Knoxville and
12:22:28 Ph.D. in Economics at the University of Georgia.
12:22:30 Q. And do you possess any certifications or licenses as
12:22:36 relates to the field of your profession?
12:22:39 A. Just a Ph.D.
12:22:40 Q. And you have a specialty as it relates to your Ph.D.?
12:22:45 A. Yes, I have several. Broadly, I'm a labor and health
12:22:50 economist within labor and health, I study crime, drug
12:22:57 policy and, more recently, mental healthcare and suicide
12:23:04 in prisons and jails, Texas prisons and jails. And then,
12:23:09 I also am also thought to be an expert in causal
12:23:15 inference.
12:23:15 Q. And does the branch of statistics used to study
12:23:21 causal inference have any specific name?
12:23:25 A. It goes by the name causal inference, usually it's
12:23:29 part of the experimental and quasiexperimental design

12:23:34 tradition.
12:23:34 Q. And as part of your study in causal inference, do you
12:23:40 ever use econometrics?
12:23:44 A. Yes.
12:23:44 Q. What are econometrics?
12:23:46 A. Econometrics is a branch of statistics. It's usually
12:23:52 you can just think of it as the use of statistics and data
12:23:57 to estimate causal effects usually, but it's not
12:24:02 exclusively that.
12:24:03 Q. Have you published any work in your field?
12:24:08 A. Yes.
12:24:08 Q. How many articles have you published?
12:24:11 A. I think it's probably 25 or something like that.
12:24:15 Maybe a little more.
12:24:17 Q. Books?
12:24:18 A. I have two books and a third one coming out this
12:24:22 summer.
12:24:23 Q. What is your first book about?
12:24:26 A. The first book is a handbook on the economics of
12:24:29 prostitution. That's with Manisha Shah. That's one of my
12:24:34 -- that's probably my main historical research agenda is
12:24:39 the economics of sex work. It was a collection of book
12:24:42 chapters by various writers, sociologists, economists,
12:24:47 physicians about the different parts of modern sex work.
12:24:53 Causal Inference the Mixtape is something more

like a textbook. It's used often by some classes as a textbook and by practitioners as like a helpful guide. And then, the remix is an updating of it, more chapters and things like that, more modern.

Q. Are you active in your field -- on any other fronts besides the writing you just described?

A. I sort of have a strange second career because of the popularity of Causal Reference The Mixtape. I started an LLC, Mixtape Consulting, but what it is, basically, is I do workshops around the world and online to try to help people that are not from Harvard and not from the top school get training in causal inference that is oftentimes not as easy to get. So I go to other countries and I try to just find ways to help people learn.

And then, I also have been running a podcast called The Mixtape With Scott where I interview scientists and try to help learn more about the personal lives, again, to help mainly young people sort of hear more about the journey that scientists and social scientists sort of go, just to kind of help people feel more connected. It has Nobel laureates, John Bates Clark Award winners. It's like an oral history of the profession.

Q. You mentioned a lot there, but for the purposes of today's discussion, would it be safe to call you a statistician?

12:26:44 A. You could call me that. I mean, I think
12:26:47 statisticians would not want to call me that but you
12:26:52 could, sure. To an intelligent layperson, they don't know
12:26:55 the difference so yes.
12:26:56 Q. To be clear, the majority of your work is in causal
12:27:00 inference, correct?
12:27:01 A. Sure. I have papers that do prediction and I have
12:27:05 papers that do pure description and those are probably the
12:27:10 three branches. But in my field of economics, we are
12:27:15 highly prized estimated causal effects. So does
12:27:25 epidemiology, too.
12:27:25 Q. I know you mentioned a moment ago teaching, but can
12:27:28 you more fully describe what you mean standard teaching
12:27:32 job is and then what your special assignment now is?
12:27:34 A. Sure. At Baylor, I teach our causal inference
12:27:40 sequence. I also historically taught other classes in
12:27:44 graduate microeconomic theory. Right now, I teach in
12:27:49 economics an artificial intelligence class and a history
12:27:52 of economics class. So those are my core at Baylor.
12:27:57 Harvard hired me to teach an under -- two undergraduate
12:28:02 statistics class for the government concentrators and
12:28:04 then, a Ph.D. class, for the government Ph.D. students and
12:28:09 the Kennedy School students in probability and statistics.
12:28:15 Q. So in your work in total, not just your
12:28:19 professorships but in your work total, what sort of issued

12:28:24 do you typically analyze?
12:28:25 A. Laws. That would probably be one of them. Not all
12:28:31 -- not always. I mean, to an economist, the rise of
12:28:36 empirical law on economics over the last 40 years probably
12:28:39 has been very influential. So we study the effects of
12:28:42 laws on things and I do that, too. Effective
12:28:46 legalization, sex work on violence against women, laws
12:28:50 that require police officers to arrest domestic violence
12:28:53 victims. Stuff I've done for Texas Department of Criminal
12:28:58 Justice is to detect and prevent suicide in the prison
12:29:03 system as well as study in the jails. Those are mixture
12:29:09 of predictions and causality but you're essentially trying
12:29:13 to catch people that are going to hurt themselves and
12:29:16 then, you come up with programs, and then, you evaluate if
12:29:19 the programs actually work. So I do those kind of things.
12:29:22 I also -- that's probably enough. Yeah.
12:29:26 Q. And I think you just mentioned the work you do about,
12:29:32 I think you said, self-harm with people hurting
12:29:35 themselves. Can you just talk about that a little bit
12:29:37 more?
12:29:37 A. Sure. Self-harm, suicides, the leading cause of
12:29:43 death -- leading single cause of death in jails, it's the
12:29:46 second leading cause of death in Texas jails and it's the
12:29:50 second leading cause of death in America prisons -- and I
12:29:54 believe the data is not out yet, but I think that Texas'

12:29:59 leading cause of death in the prisons is suicide. So it's
12:30:05 a major problem. The general population suicide rate is
12:30:09 in the teens and at the prison system, it's like 29 per
12:30:14 100,000 inmates, and in Texas, it's the upper 30s so it's
12:30:19 extremely high.
12:30:21 And it's a global phenomenon. It's not just
12:30:24 Texas. It's all over the United States. All over the
12:30:27 world. Part of it is thought to be because of the sorting
12:30:31 of severely mentally ill people into corrections. So I
12:30:35 have a, you know, a history with these things in my
12:30:42 family. And so, my whole research agenda, to the best of
12:30:46 my ability, is to try to help corrections help people.
12:30:50 Help them not hurt themselves.
12:30:54 Q. Your Honor, at this time, defendant would offer Dr.
12:30:56 Cunningham as an expert in the field of statistics and
12:30:59 causal inference.
12:31:02 MR. DUKE: No objection.
12:31:03 THE COURT: So recognized.
12:31:04 MR. MICKLE: I'd like to move Defendant's 196,
12:31:08 which is his CV.
12:31:09 MR. DUKE: No objection.
12:31:10 THE COURT: So admitted.
12:31:13 Q. (BY MR. MICKLE) So, Dr. Cunningham, were you retained
12:31:16 by the defendant in this case to perform work?
12:31:17 A. Yes.

12:31:18 Q. What were you asked to do?
12:31:19 A. Evaluate Dr. Skarha, Et Al, that article in JNO 2022.
12:31:26 Q. So for the purposes of today, if I refer to the
12:31:28 article as the JNO article, you'll know what I'm talking
12:31:32 about, right?
12:31:33 A. Yes.
12:31:34 Q. And, your Honor, for the Court's reference, I know it
12:31:37 was specifically discussed at great length in prior
12:31:40 deposition excerpts, but this is Plaintiffs' Exhibit 70 to
12:31:44 the PI. It's also Plaintiffs' Exhibit 70 to this case.
12:31:50 Dr. Cunningham, did you work alone in this work
12:31:56 you were asked to do for defendant?
12:31:58 A. Had assistance from Jonathan Seward, who's an
12:32:02 Assistant Professor at Baylor University in the economics
12:32:05 department, and Christopher Cornwell, who's a full
12:32:08 professor at the University of Georgia in the economics
12:32:10 department.
12:32:10 Q. And I know they aren't here and they're not
12:32:13 testifying, but just briefly tell us about their
12:32:16 expertise.
12:32:16 A. They're both applied econometricians and data
12:32:21 scientists. Chris Cornwell is a -- you would definitely
12:32:24 call him an econometrician. He's published very widely.
12:32:28 He's also an applied labor economist, also studies
12:32:32 education. He was my advisor at the University of

12:32:36 Georgia. Jonathan was one of my students, did his Ph.D.
12:32:39 in health services research. He's what you would probably
12:32:42 call a health economist. He's also very strong in
12:32:50 econometrics and the three of us work on projects with --
12:32:54 in corrections. That's the team that I mentioned on the
12:32:57 project study on suicide and self-harm and mental illness
12:33:02 in Texas Department of Criminal Justice prisons and one
12:33:05 single urban -- large urban county here in Texas jail.
12:33:12 The three of us.
12:33:14 Q. Now, to be clear, were you asked to attack Dr.
12:33:20 Skarha's capabilities?
12:33:20 A. No.
12:33:21 Q. Were you asked to attack Dr. Skarha personally?
12:33:25 A. No.
12:33:25 Q. Have you ever met Dr. Skarha?
12:33:26 A. I have not.
12:33:27 Q. Do you have any opinions on Dr. Skarha as a person?
12:33:30 A. No.
12:33:31 Q. For your review, the team's review of the JNO
12:33:41 article, what materials did you review?
12:33:42 A. The JNO itself, Dr. Skarha's dissertation, very
12:33:48 scholarly articles, her dissertation code, data sets that
12:33:52 she sent us, e-mail correspondence between her and ICPSR,
12:33:57 which was the data warehouse for the work that she did as,
12:34:04 well as data sets that she provided us, and then, also,

12:34:08 publications that she used for -- from TPCA to construct
12:34:12 her air conditioning data.
12:34:14 Q. For a project of this type, those would be standard
12:34:22 materials that you would review in an analysis like this?
12:34:24 A. In this kind of case, I've never done this before,
12:34:27 but that's exactly -- yes, that is exactly what you would
12:34:30 need.
12:34:30 Q. So let's turn now from when you reviewed to what you
12:34:36 did. What methodologies did you use to evaluate the JNO
12:34:41 article at issue in this case?
12:34:43 A. Probably, I would in my internal thoughts, I called
12:34:47 it a forensic audit, but probably more generally, it would
12:34:50 be called something like reproducibility. The effort was
12:34:55 to the best of our ability see if we could recreate her
12:35:00 exact numbers with as much of the same data as possible,
12:35:04 and then, to see the robustness of the results to see how
12:35:08 fragile they were if you made reasonable analytical
12:35:13 changes, things that are not controversial.
12:35:15 Q. So I know you and your team wrote two reports in this
12:35:20 case and you were also deposed at great length so there's
12:35:23 a lot that's been said about your analysis. I want to ask
12:35:26 you about some specifics. I believe you previously
12:35:30 offered evidence on something called placebo and
12:35:33 falsification. Do I have that correct?
12:35:35 A. Yes.

12:35:35 Q. And was that part of your methodology in this case?
12:35:38 A. It was.
12:35:39 Q. Why did you use placebo and falsification as your --
12:35:43 part of your methodology in this case?
12:35:45 A. For a few reasons. They're sort of related and sort
12:35:50 of different. So one of the key parts of what Dr.
12:35:58 Skarha's team does is they do the case crossover design,
12:36:01 which is appropriate for studying heat, but the case
12:36:05 crossover design is not appropriate for studying air
12:36:07 conditioning. And what they do is they compare a group of
12:36:11 prisons that they've labeled with AC and a group of
12:36:16 prisons that they've labeled not with AC and they've
12:36:21 compared them. And you are only able to do that kind of
12:36:26 comparison if it's a randomized experiment. That's sort
12:36:31 of -- that sort of simple comparison between two group
12:36:34 means even with case crossover even having ripped out the
12:36:38 individual characteristics, it's only just if you've got
12:36:41 true random assignment.
12:36:42 Well, if you have true random assignment, the
12:36:47 covariates should be the same. It should be that the two
12:36:50 groups are completely identical to one another on average
12:36:55 except for the effects of the treatment. But you can't
12:36:57 really look at that during the heat months because the air
12:37:02 conditioning's turned on or not. So what we did was we
12:37:05 went to the cold months.

12:37:07 We looked at 2005 to 2019 data on prisoner
12:37:11 mortality and we looked at what the characteristics of the
12:37:16 prisons were, how old they were, how big they were, and we
12:37:21 looked at all of the elements regarding the mortality, the
12:37:25 overall mortality between the prisons, the kinds of
12:37:28 violent mortality, the kinds of accidental mortality to
12:37:31 see if these really were exchangeable prisons. That's the
12:37:36 statistical term. Are these two groups more or less the
12:37:38 same and they were radically different. Their baseline
12:37:43 mortality rates were -- depending on if you put even just
12:37:46 a -- if you left in a couple of prisons, you'd have them
12:37:50 be -- one side might be three times larger mortality rates
12:37:55 at baseline and then, you take two prisons out and, all of
12:37:58 a sudden, it's like half the size. So they swing all over
12:38:01 the place. And the ones that are the true no
12:38:07 air-conditioned prisons, they are much older. Five of
12:38:10 them were built in 1800s. They have what appears to be
12:38:15 extremely high violence, very high suicide rates, huge
12:38:20 disparities by race.
12:38:23 So one of the reason what we came to the
12:38:26 conclusion is that whatever this labeling of an
12:38:32 air-conditioned prison is, whatever the labeling of the no
12:38:35 air-conditioned prison is, it's far more than just air
12:38:40 conditioning. You could just as easily call old and young
12:38:44 prisons, you could call them big, small prisons, could

12:38:46 call them violent, nonviolent prisons, and you could
12:38:50 actually call them general population prisons and
12:38:53 hospitals.
12:38:54 Q. Okay. Thank you. And I believe also in your
12:38:57 evidence you've given in this case, you've talked about
12:38:59 something called covariate balance, correct?
12:39:01 A. Yeah.
12:39:02 Q. What is that and why is that important to the
12:39:04 analysis you did in this case?
12:39:06 A. Well, they don't have a research design at all for
12:39:15 studying air conditioning. They have a research design
12:39:18 for studying heat, but they do not have a research design
12:39:21 for studying air conditioning. And what they end up doing
12:39:25 is they just compare two groups. For all the econometrics
12:39:30 that's behind it, at the end of the day, it's a predicted
12:39:32 average mortality within the two groups off of that case
12:39:37 -- off of those conditional logistic progressions. That
12:39:43 is only warranted under randomization and randomization
12:39:49 would imply that the baseline mortality would be identical
12:39:55 for the two groups and that all of the characteristics of
12:39:58 the prisons and the inmates would be identical for the two
12:40:01 groups, and it is the most extreme selection that you
12:40:06 could -- it's a very extreme selection bias that is
12:40:09 detectable if you look at the winter months or the cold
12:40:12 months.

12:40:13 So I needed to see if there was covariate balance
12:40:16 to justify the comparison of the two groups and there
12:40:21 wasn't.
12:40:22 Q. There was none?
12:40:22 A. There was none. No. It's more than just this
12:40:25 labeling of air conditioning and non-air conditioning.
12:40:27 There was a lot of other stuff that makes them different.
12:40:31 Q. And I believe a moment ago, you testified to
12:40:34 something called reconstruction or repeating study,
12:40:37 correct?
12:40:38 A. Yes.
12:40:38 Q. So why was that methodology important in your
12:40:41 analysis in this assignment?
12:40:43 A. Well, replicability is a phrase that means a lot of
12:40:50 different things. It means a lot of different things even
12:40:53 within the statistics community. Replicability is, at
12:40:59 minimum, you get the necessary inputs that are needed to
12:41:04 recreate the tables and the figures. That means having
12:41:08 the proper code. That means having the proper data sets
12:41:12 and documentation that would allow you to check and verify
12:41:16 that those data sets were generated correctly.
12:41:20 So I wanted to do that. I wanted to do that
12:41:23 first and see how close could I get to her results. And
12:41:30 then, I wanted to see if the results were fragile.
12:41:40 Fragile meaning not that there is a coding mistake.

12:41:47 Fragile in the sense that if a person was to use the
12:41:54 publication that she gave us about what constitutes an
12:41:59 air-conditioned prison and a non-air-conditioned prison
12:42:02 and used only that would I find the same things.
12:42:07 If I remove the hospitals of which there was just
12:42:12 three, how big of a change do I get? I just started going
12:42:16 systematically through to see if these results would
12:42:24 persist after you made those types of decisions. And
12:42:29 that's a standard for replicability, too, and I wanted to
12:42:33 try a different data set. The data set I wanted to try
12:42:36 was the Texas Justice Initiative, which Dr. Skarha brought
12:42:39 up. It is -- contains the BJS MCI data and then, it
12:42:46 supplements it with deaths that it's missing from the
12:42:49 Office of Attorney General, and then, it deletes the 2001
12:42:54 to 2004 years because those years were not reported
12:43:00 correctly. And so, they have since 2005, since 2005, they
12:43:07 have always excluded those years so that they could have a
12:43:10 complete sample.
12:43:11 Q. When you say they have excluded, who --
12:43:13 A. TJI. I can't remember the name of the -- it's Amanda
12:43:17 something but people that run TJI, it's a nonprofit group
12:43:21 and starting 2005, they immediately made the decision that
12:43:25 the 2001 to 2004 years were unreliable. They wanted a
12:43:30 complete sample. It was audited by the University of
12:43:33 California Los Angeles, who appeared to at least endorse

12:43:40 it, said it was the highest quality prison records series
12:43:44 that have been generated that other states might copy it
12:43:49 and wanted to do that so that's what I did.
12:43:50 Q. Now, you've also testified a moment ago that as part
12:43:54 of your efforts to test Dr. Skarha's JNO article, you
12:44:01 removed the hospitals. Do you remember testifying to
12:44:02 that?
12:44:02 A. Yes.
12:44:03 Q. What effect did that have on your analysis?
12:44:06 A. Well, the biggest effect, probably, is that the
12:44:10 air-conditioned group drops from -- I don't remember the
12:44:13 top number. It was like 1,170 or something like that --
12:44:19 it was some four-digit number -- to 80. Eighty
12:44:23 observations, 80 deaths. So 93.2 percent of all of the
12:44:27 air-conditioned category is three medical facilities.
12:44:33 Hospital Galveston alone counts for 60 percent and these
12:44:36 are places with extremely high mortality. So that was the
12:44:40 main thing.
12:44:41 If you lose those 80 percent, the conditional
12:44:45 logistic progression kind of goes wild, so it's not very
12:44:48 reliable at that point and you are extremely underpowered
12:44:52 at that point.
12:44:52 Q. I'm glad you bring up underpowered because I believe
12:44:56 the other primary category you talk about and the evidence
12:45:00 you've given in this case is the power analysis, right?

12:45:02 A. Yes.
12:45:02 Q. So just explain to us why is a power analysis
12:45:06 important in work like this?
12:45:08 A. Well, Dr. Skarha would want to do it because, let's
12:45:17 say, things have gone a different way. Let's say that she
12:45:21 -- let's say that heat -- okay. She can't really do the
12:45:27 comparison. But let's just say that she's doing the heat
12:45:29 regressions on her categorized no AC prisons and let's say
12:45:35 that heat does kill people in the Texas prisons, so that
12:45:39 would be the alternative hypothesis in using statistical
12:45:45 jargon. So you always have this null hypothesis. The
12:45:48 null hypothesis is there is no effect of heat on mortality
12:45:52 and if you ever find an effect of heat on mortality when
12:45:56 there isn't one, it is because of noisy data. I could go
12:45:59 in more details about it but it's basically -- it
12:46:04 basically just means the data set that you were working
12:46:06 with is not really representative of the truth. All
12:46:10 right.
12:46:11 Well, you can get -- if the truth is that heat
12:46:16 kills people and you can always -- even if it's not true,
12:46:23 you can always fail to reject the null. One of the ways
12:46:27 that you can make it more likely to detect a statistically
12:46:34 significant result -- I know Dr. Skarha doesn't like .05,
12:46:38 but I'm assuming she likes some number. She likes .1, I
12:46:42 think, is what -- or, you know, she likes .5. Whatever it

12:46:45 is, you find some number and the way that you can get that
12:46:50 number up, the way that you can find evidence that
12:46:57 quantifies your uncertainty about the effect itself is the
12:47:00 sample size. There's other things too, but the sample
12:47:04 size is the one that you can really control. That's the
12:47:06 only one you could control. You could only control
12:47:11 getting a bigger data set.
12:47:13 And so, if there is no effect, you need a larger
12:47:18 -- and the effect size and the treatment of effects are
12:47:21 teeny tiny. You need to have a big sample. In these
12:47:25 cases, they are teeny tiny. Now, she has a chapter in her
12:47:30 dissertation where -- not this one where she had estimated
12:47:35 heat caused .52 percent increase in mortality. So that
12:47:40 would have been a natural baseline. That would have been
12:47:43 like a natural standard for her to go in and say how big
12:47:47 does my sample need to be in order to find effects with a
12:47:52 alpha of .05, which is what she uses in the JNO. She does
12:47:57 use a p-value of .05. So an alpha of .05 and power at .8.
12:48:05 And .8 means I'm going to catch a real effect about 80
12:48:08 percent of the time.
12:48:09 Well, you can do it different ways. Analytically
12:48:17 solving for the sample size using these conditional
12:48:20 logistic progressions is extremely complicated and very
12:48:23 fragile. So you could also just do simulations. You
12:48:26 could just say like if it's a .52 and you just go through

12:48:30 and you just simulate over and over and over again the
12:48:33 data, when do you hit the appropriate power?
12:48:38 Q. And I'm sorry to interrupt you. When you say when
12:48:40 you hit the appropriate power.
12:48:42 A. When will you get the appropriate power to catch it
12:48:45 80 percent of the time. How big does the sample need to
12:48:48 be.
12:48:48 Q. And that was my question. So another way of thinking
12:48:50 about appropriate power, would it be safe to say that the
12:48:52 size of the data set?
12:48:53 A. The size of the data set determine -- is one of the
12:48:56 things that determines this concept of power. The ability
12:48:59 to pick something up. Well, if the effects are as small
12:49:07 as .52, which is what she did in her chapter, her first
12:49:12 chapter, you would need a much larger data set than she
12:49:17 had. If it was exactly what she found, exactly what she
12:49:23 found, which was a .7, she's just underpowered by about
12:49:28 250 deaths and if it's a big effect, well, she's safe.
12:49:33 That's if she's done everything else right.
12:49:36 So if you draw -- so if you start dropping
12:49:40 medical facilities, if you just start dropping them, you
12:49:46 immediately start shrinking the sample size and you move
12:49:49 away from power. Move away from that threshold power of
12:49:54 .8. So there's two things that can go on. One is she got
12:50:01 lucky. She got very lucky. She doesn't have it powered

12:50:06 enough and she finds statistical significance. That's one
12:50:09 thing.
12:50:10 Or this is very noisy data and she got one of the
12:50:16 few samples under the null which happened to have
12:50:20 statistical significance at that level and with -- and one
12:50:27 of the things you typically see in the literature is that
12:50:29 these -- this has been analyzed is that these underpowered
12:50:33 studies are typically the ones that are not replicable.
12:50:38 Q. And I know you didn't use this phrase but Dr. Skarha
12:50:41 did, or it's been in the evidence in this case, but since
12:50:43 you mentioned p-values, are you familiar with the phrase
12:50:47 p-hacking?
12:50:47 A. Yes.
12:50:48 Q. What is p-hacking?
12:50:49 A. So you have to keep separate the science of
12:50:55 statistics with the professionalism of scientists. So
12:51:03 journals -- and journals are staffed by, we'll just say,
12:51:10 statisticians and social scientists, scientists in
12:51:13 general, they have decision rules for accepting papers in
12:51:19 journals and those decision rules are mapped onto broader
12:51:24 decision rules in the profession.
12:51:27 So a p-value of .05, Dr. Skarha's right, there's
12:51:32 nothing special about it. Just to briefly say the science
12:51:38 of it, all that is going on is that when you calculate
12:51:44 anything inside a data set, of any sample in the data set,

12:51:47 all that that data set is is a random draw from some
12:51:51 larger population of which there could be thousands of
12:51:55 random draws. Every single calculation that you do in
12:51:59 your data set could have been done in all the other data
12:52:01 sets. But we know, mathematically, that on average, if
12:52:09 you could do it in all the data sets on average, they'll
12:52:12 be right. And if you could allow the sample size to get
12:52:17 bigger and bigger and bigger, mysteriously enough, the
12:52:24 distribution of all those coefficients across all those
12:52:27 samples will be a bell curve.
12:52:30 And in a bell curve, the normal distribution we
12:52:33 know that 95 percent of the numbers would be 1.96 standard
12:52:41 deviations away from the mean. So, for some reason, a
12:52:46 long time ago, the statistician named Ronald Fisher said,
12:52:52 well, we need a decision rule to come up with to say what
12:52:56 does a number need to be in order for us to say that it is
12:53:00 not merely an artifact of the normal distribution and he
12:53:04 said let's use .05 and it stuck.
12:53:08 Q. And then --
12:53:10 A. And so, p-hacking, p-hacking is a process by which
12:53:19 people will pervert the work in order to get those
12:53:23 p-values at .05 so that they could get them into the
12:53:27 journals. Not so that they get the truth but so that they
12:53:31 can get p-value of .05 and try to get published with it
12:53:36 because a p-value of .06 just won't get in sometimes.

12:53:41 Q. In your line of work, has there been a recent uptick
12:53:44 in p-hacking?
12:53:46 A. It's been -- it's been documented in all the
12:53:51 sciences. Psychology has had it. Epidemiology has had
12:53:56 it. There's evidence of it in economics. It shows up --
12:54:00 there's a lot of metaanalysis that find it.
12:54:02 MR. DUKE: I would just object to if there's
12:54:05 further questions about the industry -- or, I guess, the
12:54:10 science because he said he was disclosed to provide
12:54:13 testimony with respect to this article, not the literature
12:54:16 or sociology or statistics in general.
12:54:20 MR. MICKLE: Your Honor, I think this goes right
12:54:22 to the heart of his expertise. This is his field and as
12:54:24 it relates to the facts that he's testifying to right now
12:54:27 about the significance of .05, the surrounding facts of
12:54:31 why .05 is or isn't significant are extremely relevant to
12:54:35 what we're talking about here.
12:54:36 MR. DUKE: I'm making sure what he said. He's
12:54:39 testified a lot about the significance of that. He's now
12:54:41 testifying about the conduct of the academic --
12:54:46 individuals involved in the academic pursuit perhaps in
12:54:50 efforts to like meet that statistical value. That's
12:54:56 nothing to do with the work that -- at least not connected
12:54:59 in his work here --
12:55:00 THE COURT: Is there anything in his report about

12:55:02 p-hacking and about this phenomenon?
12:55:05 MR. MICKLE: I believe he was asked about it at
12:55:08 his deposition.
12:55:08 THE COURT: Okay. I'll allow it. Go ahead.
12:55:11 Q. (BY MR. MICKLE) So, Dr. Cunningham, these four
12:55:15 categories, the placebo falsification, the covariate
12:55:19 balance, the reconstruction and the power analysis, are
12:55:23 these methodologies generally accepted within your area of
12:55:26 expertise?
12:55:27 A. Yeah.
12:55:28 Q. And are these methodologies reliable?
12:55:30 A. When done properly, yes, they're informative.
12:55:35 Q. So let's turn specifically to the JNO article. Do
12:55:43 you know how experts in your field typically analyze
12:55:46 reliability of another expert's conclusions in an article
12:55:50 like this JNO article?
12:55:52 A. They would get the original data. They would get the
12:55:54 code. They would have the documentation that would allow
12:55:57 them to independently verify the things were constructed
12:56:00 carefully or correctly, and then, they would redo the
12:56:03 analysis to see if they could get the exact numbers. That
12:56:07 would be the first thing that they would do. That's kind
12:56:09 of the bare minimum.
12:56:11 Then they would go through and they would say
12:56:15 let's use a different data set that also measures

12:56:18 mortality or the superior one. Then they would say can we
12:56:23 reconstruct the treatment variable ourselves? Is it
12:56:26 disputable? Is it a noncontroversial construction that
12:56:30 experts would agree on? They would do that kind of thing.
12:56:34 They might do more. They might try different estimators
12:56:38 but we didn't do that. We stuck to hers.
12:56:40 Q. Did you and your team use both those methodologies?
12:56:43 A. To a point. We used the Texas Justice Initiative
12:56:51 mortality data. The Texas Justice Initiative mortality
12:56:57 data -- so both TJI -- both the Office of Attorney
12:57:03 General's, which is one of the historic repositories for
12:57:10 TDCJ's mortality data, and BJS MCI, those are historically
12:57:16 where the Texas prison system would send their mortality
12:57:23 data. They send to it the Office of the Attorney General
12:57:25 because there was a law that was passed in '83 and they
12:57:27 sent it to BJS because of a law that was passed in 2000,
12:57:33 Death of Custody Reporting Act 2000. The 1983 one was
12:57:38 there on paper, it wasn't really enforced, so it was kind
12:57:42 of erratic.
12:57:43 The BJS was a new program. As Dr. Skarha said,
12:57:48 all prisons had to comply 2001. In 2001 and 2004, it was
12:57:53 very erratic. But after 2004, it starts to get good, but
12:58:03 it's still missing deaths. TJI took all of BJS's data,
12:58:10 all of the MCI, so the data that she uses minus '04 is
12:58:14 what is in my data set so I have all of it plus the Office

12:58:19 of Attorney General data set that not in there. So I used
12:58:24 that.
12:58:25 Q. And earlier, you used the term "replicable." Do you
12:58:33 remember testifying about that?
12:58:33 A. Yes.
12:58:34 Q. So does the word "replicable" have a special
12:58:39 definition to you with respect to the JNO article?
12:58:42 A. Yes.
12:58:43 Q. And what is that?
12:58:45 A. Can I, could I recreate the air conditioning -- I'll
12:58:57 list the first one. Can I recreate the air conditioning
12:59:00 file myself?
12:59:01 Q. Could you?
12:59:02 A. No.
12:59:02 Q. If you could not replicate the air conditioner file,
12:59:06 you could replicate the JNO article itself?
12:59:10 A. Well, I would have to get the BJS data. But the
12:59:14 answer to that even if I had the BJS data, I would not be
12:59:18 able to recreate it insofar as that is the -- insofar as
12:59:22 the air conditioning -- insofar as I follow the rules that
12:59:27 are outlined in the paper and I come up with an air
12:59:33 conditioning file, I would not be able to recreate it
12:59:39 because it does not appear to be the same one that's in
12:59:41 the paper nor is it the same one that she sent me.
12:59:45 Q. Okay. So the question I have for you then is did Dr.

12:59:49 Skarha do anything in her methodology that departs from
12:59:54 the accepted methods for the study like the JNO article?
13:00:04 A. I think probably the poor documentation of the
13:00:09 air-conditioning construction would be one of them. She
13:00:13 uses the TPCA -- this TPCA document. TPCA document and
13:00:20 then she says she also used TDCJ to get the
13:00:24 air-conditioning assignments. She does not document where
13:00:28 she got the TDCJ data. Sometimes she says -- there's
13:00:33 three statements that she's made: Dissertation, JNO and
13:00:36 the exhibit. Sometimes she says that she got it from
13:00:39 TDCJ, which sounds like a handoff. Sometimes she says
13:00:43 that she got it from a TDCJ website, but there's no screen
13:00:48 shots, no URL of it, so it's not clear where it came from
13:00:52 or what she got.
13:00:55 From the TPCA, the TPCA does their own
13:00:59 classifications and so, you know, you don't know how they
13:01:02 made that. One of them, in particular, they have three
13:01:06 categories of air condition. They have fully
13:01:10 air-conditioned, no air conditioned, so these are like
13:01:14 hundred percent; and then, there's a big chunk in the
13:01:17 middle called partial. And then, the big chunk in the
13:01:21 middle called partial, it lists things like the number of
13:01:25 dormitory rooms and the percent of them that are
13:01:28 air-conditioned. There will be like these naming of
13:01:31 physical parts of the buildings and that those are

13:01:33 air-conditioned.

13:01:34 So it would have been helpful in the JNO if all
13:01:40 of that could have been sourced to the primary sources so
13:01:44 that a third party could go I have a recipe and all I
13:01:49 gotta do is follow this recipe and I will get exactly what
13:01:54 Dr. Skarha got. So --

13:01:58 Q. I'm sorry to interrupt you. Using your analogy, were
13:02:03 you ever given a recipe of this type?

13:02:04 A. Well, you're given -- not exactly. You're given that
13:02:11 document, but there is no clear explanation in the JNO
13:02:15 what makes that document authoritive -- authoritative.
13:02:19 You don't know how that partial was constructed, how
13:02:22 anybody knew exactly those counts of how many beds were
13:02:26 air-conditioned. That's not clear at all. So that's not
13:02:32 there. But then, there is something called -- it's not
13:02:36 she doesn't say majority rule, but she says if the prison
13:02:41 has majority air conditioning, which sounds like more than
13:02:44 50 percent, but if I use the more than 50 percent, I'm
13:02:47 unable to recreate the air-conditioning data set that she
13:02:50 sent me. She sent me two and they contradict each other.

13:02:54 So the like -- you know, the thing that I would
13:03:00 just, I guess, say is that on a formal audit-style thing,
13:03:07 I cannot -- I can't make the air conditioning file. If
13:03:15 the air conditioning file that I was given is the one that
13:03:19 was used, which even that air conditioning file does not

13:03:21 match some of the counts that are listed in the JNO, you
13:03:29 aren't really sure what's the truth. You're not sure if
13:03:32 there was another file because I was given two. There
13:03:35 appear to be possibly three.
13:03:37 And then, there's e-mail correspondence between
13:03:39 her and ICPSR which she says her memory is fuzzy. So
13:03:44 you're just sort of left with a lot of uncertainty as to
13:03:47 which of the individual prisons in the mortality data are,
13:03:51 in fact, air-conditioned and not air-conditioned because
13:03:55 you're just sort of stuck with a paper. And without the
13:04:00 subpoena, we would have never even gotten the Excel
13:04:03 spreadsheet and even then, we were given two and they kept
13:04:07 -- and they contradicted each other.
13:04:09 So no. The point of it, I don't even see how --
13:04:13 I don't really see how one can recreate it because the
13:04:18 ground truth isn't clearly being conveyed and there's no
13:04:22 set of instructions to go back and verify it and recreate
13:04:26 it yourself.
13:04:27 Q. Was that also the conclusion you arrived at with your
13:04:30 teammates?
13:04:32 A. Yes.
13:04:32 Q. Your Honor, would this be a good time to stop for
13:04:35 lunch?
13:04:36 THE COURT: Sure. It's 1:05. We'll take a
13:04:41 30-minute break and we'll be back and resume the testimony

13:04:44 at that time.

13:04:59 (Lunch recess.)

13:37:52 THE COURT: Come on back up, Dr. Cunningham. You may proceed.

13:38:12 Q. (BY MR. MICKLE) Thank you, your Honor.

13:38:12 Dr. Cunningham, earlier in your testimony, you reference the case crossover design. Do you remember talking about that?

13:38:16 A. Yes.

13:38:19 Q. Did Dr. Skarha use the case crossover design in this JNO?

13:38:21 A. Yes, she did.

13:38:22 Q. What are your thoughts on that?

13:38:30 A. It's a well-established methodology in epidemiology for studying acute outcomes like mortality responses to these kind of transient events like heat.

13:38:30 Q. And what do you think about its applicability in the question Dr. Skarha sought an answer for in this case?

13:38:32 A. Well, the heat mortality literature is very well established and that method is used. Historically, I don't know if Dr. Skarha is the first to use it in the prison setting. I couldn't quite get a handle on the history of it, but I think maybe that was one of the innovations of her work is to take this established case crossover and apply it to the prison setting.

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13:39:23 And if I had not read the paper, I would have
13:39:25 probably thought it was fine and, I guess, having worked
13:39:29 through the project, it's not obvious that it is
13:39:34 applicable in the Texas prison system for reasons -- for
13:39:41 various reasons.
13:39:41 Q. Well, I believe you talked about that in your report.
13:39:44 So what are those reasons why it's not applicable in the
13:39:46 Texas prison system?
13:39:47 A. Well, the first thing is the -- her research question
13:39:51 is about air conditioning so just to get it out of the
13:39:54 way. The case crossover design is not used to study the
13:39:58 fixed characteristics of buildings. It's used to study
13:40:04 these fluctuating environmental toxins of which you could
13:40:08 make an extension to the heat index. So that would be the
13:40:11 first thing is just to kind of qualify and say it's really
13:40:15 not for the research question. She has an approach that
13:40:17 she takes but it's not for that.
13:40:19 There is something about this prison system that
13:40:25 I think there's -- it's not clear what is going on in the
13:40:29 data except that when you look at the groups that you know
13:40:36 do not have air conditioning that you're a hundred percent
13:40:41 positive, at least she's in that authoritative source.
13:40:44 There is no effect of heat on mortality in the no
13:40:51 air-conditioned prisons. The pure ones. These are
13:40:53 violent prisons. They -- I don't exactly know the history

13:40:57 of heat with them, but I believe they've got a long kind
13:41:00 of history of heat controversies. So if it was going to
13:41:04 be anywhere, it would be there.
13:41:07 And then, when you talk the same model and you
13:41:10 apply her case crossover model to the unambiguously fully
13:41:16 air-conditioned prisons, most of whom are hospitals who
13:41:19 can't really respond to the external temperatures, the
13:41:25 sign flips from what she finds. She finds these kind of
13:41:28 bizarre negative effects on -- negative meaning when it
13:41:33 gets hot, heat actually saves lives in air-conditioned
13:41:38 prisons. That's what she finds in her JNO.
13:41:41 But when you use the original assignment, not
13:41:46 only is it no longer negative, but now it has an extremely
13:41:50 positive coefficient, which I don't think is going on. It
13:41:55 doesn't make any sense. So just to kind of step back,
13:42:01 causal inference and statistics, they are different. They
13:42:05 are different. You can always run a conditional logistic
13:42:12 progression with fixed effects. That's at the end of the
13:42:14 day, case crossover is just a calculation. You can always
13:42:17 do it and you'll always get a number so there's nothing
13:42:20 about it and the number will be right because it's a
13:42:23 mathematical calculation that has a known solution. The
13:42:29 interpretation of it as causal is -- hinges on a bunch of
13:42:36 assumptions that can hold in one data set and not hold in
13:42:40 another.

13:42:41 And just a few things that you kind of do know
13:42:43 that are going on in the prison data, it does make you
13:42:46 have doubts about the case crossover. The most obvious
13:42:49 one being it's not clear that when someone dies at
13:42:55 Hospital Galveston that they had been at Hospital
13:42:59 Galveston for a month because Hospital Galveston is where
13:43:06 people are going to die or they're hurt and injured, which
13:43:09 means they might have been transferred there.
13:43:12 Well, the case crossover design does this. It
13:43:15 says, I died today on April 8tj. I died today on April
13:43:22 8th. So you put in the data set -- you put in the data
13:43:25 set, you put a No. 1 on April 8th and then, you put
13:43:28 whatever the temperature is, and then you say what was the
13:43:33 temperature a week ago in Galveston? And then you go what
13:43:40 was the temperature for the other Wednesdays of the month
13:43:42 and you get the temperature there.
13:43:43 Well, the populations in the TDCJ, they move
13:43:49 these people around a lot for all kinds of reasons but
13:43:52 particularly, injuries. You get hurt at Beto, you start
13:43:57 to have a crisis, a health crisis at Beto, many of them
13:44:00 will move to a hospital and then die, which means that the
13:44:06 case crossover has all these features in it that might be
13:44:11 undermining its utility for the study.
13:44:15 Q. And the moving around specifically with regards to
13:44:18 these hospital locations like Galveston, is that something

13:44:21 that cause you to question whether case crossover was
13:44:25 appropriate?
13:44:25 A. It definitely causes me to question it, but it's more
13:44:29 that it makes you ask questions and you can't answer the
13:44:33 questions from the data set. You would need to go consult
13:44:35 with TDCJ and get a full census of where everybody was.
13:44:40 And the fact that you don't find effects, that's the most
13:44:44 troubling thing for me is that you do not find -- it's not
13:44:49 nothing about statistical significance either.
13:44:51 When you run her model on the original no
13:44:55 air-conditioned set of prisons, it's not that you get a
13:44:59 nonstatistically significant effect but it is
13:45:03 nonstatistically -- you get a zero, a 0.04 percent down
13:45:09 from 0.7 percent. And it's like if these effects were
13:45:18 going to be anywhere, I would think it's going to be
13:45:21 there. And the fact that it's not there and the only time
13:45:26 you can get it is this complete rearranging of the
13:45:29 partially air-conditioned prisons and reconstructing it in
13:45:34 this way that's debatable, absolutely, like that is not
13:45:42 controversial to say that that is absolutely debatable
13:45:44 that you should combine in a control -- in a treatment
13:45:48 group huge variation in dosage. Some of those deaths have
13:45:52 been reclassified away from the fully air-conditioned
13:45:55 prisons into that one.
13:45:57 So there's all these choices that are being made

13:46:00 that you have a hundred people do this study. If a
13:46:05 hundred people do this study, I don't know how many are
13:46:09 going to come to that conclusion.
13:46:10 Q. Well, let me ask you about that you just mentioned
13:46:12 the air-conditioning data. So I believe you testified
13:46:17 earlier that Dr. Skarha's report required taking three
13:46:22 categories, air-conditioning data and collapsing testimony
13:46:25 down into two categories, correct?
13:46:27 A. Yes.
13:46:28 Q. So what is the significance of that?
13:46:31 A. Well, I don't know why Dr. Skarha did it. I couldn't
13:46:37 quite figure it out from the paper. I don't quite know
13:46:40 why she made that decision. I'm not challenging it. I'm
13:46:43 saying I don't really understand the decision because if
13:46:47 it was me, I would have just left it as like the fully
13:46:53 air-conditioned, the no air-conditioned, and partial.
13:46:57 Now, in causal inference, when you do an
13:47:01 experiment -- causal inference comes from the experiment
13:47:05 tradition. Less so the econometrics. It comes from the
13:47:08 experimental design tradition where you do here's a
13:47:11 treatment group, here's a control group, and when you do
13:47:14 it like that -- if you think about like a vaccine trial or
13:47:16 you think about -- yeah, like a vaccine trial or maybe
13:47:19 like a trial where you're looking at the effect of Tylenol
13:47:22 on Tylenol's effect on headaches.

13:47:27 Well, what you would want to do, you would want
13:47:29 it to be that the treatment group all had three, you know,
13:47:32 three pills of Tylenol and then, the control group have
13:47:36 only placebos. It wouldn't make any sense for you to go,
13:47:39 the treatment group's going to have -- most of it's going
13:47:42 to be three pills. I'm going to give some time four and
13:47:45 then, I'm going to have a bunch of people that I don't
13:47:46 give anything to. And then, I'm going to have here the
13:47:49 control group that's supposed to have no Tylenol at all,
13:47:53 I'm going to have actually about maybe half of them, I'm
13:47:55 going to give Tylenol to.
13:47:57 And so, the challenge is not that it's not that
13:47:58 you can't do that experiment, it's that you literally
13:48:01 don't know what the answer -- you don't know what you've
13:48:05 measured and that's what she did. She mixed the dosage.
13:48:10 You've got all these partially air-conditioned prisons and
13:48:12 some fully air-conditioned prisons in the no
13:48:15 air-conditioned prisons and it doesn't -- just from -- I'm
13:48:20 not saying -- just from my perspective because there is a
13:48:23 lack of clear documentation about all of these decisions,
13:48:27 it's just this huge red flag that you're just -- I have
13:48:32 never been able to get over it.
13:48:46 Q. As you described, she's combining them. What effect
13:48:52 does that have on her work and your expertise in the field
13:48:56 of causal inference?

13:48:57 A. Well, in the work itself so we can disentitle it
13:49:02 because I have the TJI data and I was able to map every
13:49:06 inmate to the appropriate -- to the prison using the
13:49:10 address and the county where they died in the TJI, you can
13:49:14 figure out exactly what prison they were in. I can go
13:49:18 back to the original TPCA list of prisons that started out
13:49:25 what she says is her authoritative list, which is already
13:49:29 something that you would like to kind of know a little bit
13:49:31 more about. You would like to know these websites where
13:49:34 people got it. But let's just say that it's true.
13:49:36 I can actually, systematically go back from her
13:49:43 final assignment and just figure out where does this .7
13:49:50 percent come from? .7 percent is for every one degree
13:49:56 Farenheit in the heat index over 85 degrees, she finds a
13:50:00 .7 percent increase in mortality, which we all know in
13:50:04 Texas, the temperatures swing a lot. So that adds up a
13:50:09 lot. That's her finding. That's a big number. It's not
13:50:12 a huge number so it's a big number.
13:50:15 So okay. Well, how does she get there? Well, if
13:50:19 you start from the original, that zero, all you gotta do
13:50:22 is take those partials out. You just take those partially
13:50:27 air-conditioned prisons out of that assignment and it just
13:50:30 immediately becomes -- it immediately, you put -- sorry.
13:50:34 Yeah. In her original thing, you take them out and as you
13:50:37 take them out, you get to the zero which means that the

13:50:42 true undisputed no air-conditioned prisons that are like
13:50:50 some of them are from the Civil War era, five of them in
13:50:54 the 1800s, a couple in early 20th century, very violent
13:50:59 prisons, you run the regression on that, nothing.
13:51:05 And so, it's just -- it just makes you go -- it
13:51:13 just makes it seem like case crossover was never designed
13:51:16 for the Texas prison system. That's the conclusion you're
13:51:19 left with. It doesn't mean that case crossover is a
13:51:22 flawed design. It just means that sometimes designs are
13:51:27 not appropriate for every single population.
13:51:31 Q. Sure. And I know you've alluded to this throughout
13:51:34 your testimony, but I want to ask you a question about the
13:51:37 mortality data you keep talking about, the TJI the BJS.
13:51:41 Why are those important to you in your expert opinion in
13:51:47 this case?
13:51:47 A. Why is the -- can you say that one more time?
13:51:49 Q. Sure. You mentioned with some importance the TJI
13:51:53 data and the Bureau of Justice Statistics data earlier in
13:51:56 your testimony. Why did you call out those data sets --
13:51:59 mortality data sets? Why are they important in your
13:52:02 analysis?
13:52:02 A. Well, why are they appropriate. TJI is the authority
13:52:12 over the Texas prison mortality. They are the authority.
13:52:18 UCLA agrees. Arnold Ventures agrees. I would not
13:52:22 consider myself an authority over Texas prisoner mortality

13:52:26 even though that is my research agenda, even though I
13:52:29 worked directly with it and I study it. I don't study
13:52:32 heat and I don't study the lengthy time series. I study
13:52:36 contemporaneous stuff kind of post-COVID.
13:52:40 So they are the authorities and when this group
13:52:45 set out to create a panel, a definitive data set on prison
13:52:53 deaths, they start in '05 and the reason they start in '05
13:53:00 is because 2001 to 2004 suffered from, lack of better
13:53:04 word, measurement error and omissions. And those
13:53:07 omissions were actually from one thing I've read, they
13:53:10 were underrepresenting the institutionalized populations,
13:53:14 if I'm not mistaken, and that kind of gets into some of
13:53:19 the treatment categories.
13:53:20 So it's not -- I don't think that the 2001 to
13:53:26 2004 data, it has like deaths that didn't happen. It's
13:53:29 just that it doesn't have other deaths that did happen and
13:53:35 those deaths that didn't happen would have been in the
13:53:37 case crossover design, they would have had temperatures
13:53:41 assigned to it and we don't know what those results are.
13:53:44 So TJI data is a reasonable one to use for two
13:53:50 reasons. Experts say it is. That's been agreed upon by
13:53:56 third parties like Arnold and UCLA, Behind The Bars group,
13:54:01 and then, secondly, it also has the BJS data. That's the
13:54:04 other thing. It's inside of the TJI data is the BJS data
13:54:10 plus these additional OAG deaths, which are not in BJS

13:54:17 data. So this is where you're left. You're left with if
13:54:21 your results are entirely contingent on the inclusion of
13:54:28 the questionable data, then it stands to reason that they
13:54:32 are fragile or that is another piece of evidence that they
13:54:35 are fragile.
13:54:37 Q. And I think you also earlier referenced something
13:54:39 called the ICPSR data?
13:54:43 A. ICPSR is the warehouse -- Bureau of Justice
13:54:47 Statistics doesn't work directly with the researchers.
13:54:49 There's a warehouse called ICPSR at the University of
13:54:53 Michigan and they basically -- just think of them as like
13:54:55 a giant Costco of data sets and one of them is the BJS
13:55:01 MCI.
13:55:01 Q. And did Dr. Skarha use data from the ICPSR in her
13:55:05 analysis?
13:55:05 A. Yeah. She used MCI. She used the Bureau of Justice
13:55:09 Statistics MCI. And to work on the MCI, you go and you
13:55:13 work with ICPSR. I believe that she had to like go in a
13:55:16 room, in a locked room and do all the analysis there.
13:55:18 That's kind of a common thing for these highly protected
13:55:22 data sets.
13:55:22 Q. And sounds like you're familiar with ICPSR; is that
13:55:27 fair?
13:55:27 A. Yeah. We're all familiar with it because it's
13:55:30 famous, yeah.

13:55:31 Q. Did you request the same data from Dr. Skarha that
13:55:35 she got from ICPSR?
13:55:38 A. Yes.
13:55:38 Q. Did you ever get it?
13:55:39 A. No.
13:55:39 Q. Even if you had gotten it, would you have been able
13:55:42 to recreate Dr. Skarha's study?
13:55:45 A. Well, it's possible that if I had it and I just hit
13:55:50 "go" on the code -- I'm not positive I had the right code,
13:55:53 though, that she sent because she sent her dissertation
13:55:56 code and -- she also sent the air conditioning file and
13:56:01 then, she replaced the air conditioning file, and neither
13:56:04 air conditioning file exactly matches the JNO in terms of
13:56:07 the count. So I don't know.
13:56:08 But if I had used -- but the -- really, the thing
13:56:13 is that air-conditioning file. I can't create that -- I
13:56:20 don't have the ground truth of what the true
13:56:22 air-conditioning file is, but if I follow the rules that
13:56:24 she put in the JNO, I cannot recreate either of the
13:56:28 air-conditioning files that she gave me, which could mean
13:56:31 there's a third one or it could have been cleared up with
13:56:35 documentation.
13:56:38 Q. So, Dr. Cunningham, you were in the courtroom earlier
13:56:41 when you heard testimony from Dr. Skarha on video,
13:56:44 correct?

13:56:45 A. Yes.
13:56:47 Q. And I believe she was testifying about the p-values
13:56:53 for a significant portion of that, correct?
13:56:55 A. Yes.
13:56:56 Q. I know you testified earlier about p-values, but do
13:57:00 you have any specific reaction to her opinions as played
13:57:03 today on p-values?
13:57:06 A. Well, she did -- feels pedantic a little bit to just
13:57:13 note this, but she did have an incorrect interpretation of
13:57:16 the p-value once, but it went by real fast and maybe it's
13:57:19 just her way of talking to a lay audience. But the .05 is
13:57:24 not the probability. It's not the probability that no
13:57:28 hypothesis is true. So that's a -- so part of this ASA
13:57:32 document that she quoted that she sent us, it was ironic
13:57:35 that she said that because part of what that is about is
13:57:39 the gross miss interpretation of p-values across the whole
13:57:42 world.
13:57:43 People routinely misinterpret what p-values are
13:57:48 because p-value is -- when you actually look on paper at
13:57:52 what a p-value is, it is so mind numbingly tedious that
13:57:58 it's so natural that they would go, I'm just going to call
13:58:00 it a five percent probability that I'm wrong and that is
13:58:03 not what it means.
13:58:04 Q. And I believe you just mentioned something called the
13:58:07 ASA. If I understood correctly, that was a reference to

13:58:09 one of the articles that Dr. Skarha brought to her
13:58:13 deposition?
13:58:14 A. Yeah, the ASA American Statistical Association
13:58:16 released -- it was kind of interesting. They like
13:58:18 released this like big opinion piece that had like 40
13:58:24 signatures saying p-value's a horrible measure and we need
13:58:29 to get rid of it and we need to stop saying statistical
13:58:32 significance. It was actually kind of radical. It was
13:58:34 mixed a bunch of things. It kind of mixes all these like
13:58:38 different -- you had to sense it was like by a committee
13:58:41 that it was made. So p-hacking was one of them. People
13:58:50 are p-hacking. We've set this threshold at .05 and
13:58:55 they're p-hacking. Well, documented. It's creating a
13:58:59 biased scientific record so that's one. Number two, our
13:59:03 teachers of statistics have been so unsuccessful at even
13:59:08 helping one another articulate what a p-value is. We need
13:59:13 to not use it. And then, number three was kind of this
13:59:16 like it's arbitrary type thing.
13:59:20 So I would love to have a conversation with Dr.
13:59:27 Skarha and just learn a little bit more about what she
13:59:29 wants to do, instead, because she really emphasizes in
13:59:34 paper the confidence intervals. That's what she typically
13:59:38 presents. She presents more confidence intervals, 95
13:59:41 percent confidence intervals are mathematically directly
13:59:45 related to the p-value of .05. You change the p-value of

13:59:49 .05, you change those confidence intervals. They both
13:59:52 come from standard errors. They both come from T
13:59:54 statistics. They both come -- you don't -- they just are
13:59:58 what you get with confidence intervals is a separate piece
14:00:01 of information they get from the p-value.
14:00:04 So I would love to know is what is being
14:00:10 advocated by raising the p-value to be less confident in a
14:00:17 result? Because that's what you're doing. When you're
14:00:19 raising the p-value, when you're saying I want the p-value
14:00:22 to be .1, what you are basically saying is I am going to
14:00:26 be okay with false positives.
14:00:29 Q. And what is the danger of false positives?
14:00:32 A. Okay. What is the -- in court, it would be null. In
14:00:39 court, it would be the defendant is innocent and I'm going
14:00:43 to find him guilty. That is what the p-value is trying to
14:00:46 control. The p-value is the core equivalent of beyond a
14:00:52 reasonable doubt. That's what it is. Beyond a reasonable
14:00:55 doubt is a .05 p-value. So if you raised it, if you said
14:01:01 I can't do it anymore, it's too hard to reach .05, let's
14:01:04 do .1, that is the equivalent of saying I'm going to be
14:01:07 okay with a few more people that are innocent being found
14:01:10 guilty. That is literally what you're doing because
14:01:12 you're rejecting the null at a much -- with far less
14:01:18 evidence.
14:01:19 Q. This is based on your review of the information of

14:01:21 the article she brought to her deposition?
14:01:23 A. Yeah. Well, I mean, I teach this. I literally teach
14:01:26 it to the undergrads at Harvard and I teach it to the
14:01:29 Ph.D. students. I literally just spent a whole semester
14:01:33 trying to convince these students to believe me on it and
14:01:36 work through it, you know. Like in physics, they went in
14:01:42 the other direction. P-values for them are like
14:01:49 .00000001, seven leading digits. Well, this is like -- I
14:01:55 mean, now I'm just kind of saying my expert opinion, but
14:01:58 like when lives are at stake and things like that, I think
14:02:03 you have to go more.
14:02:03 Q. Let me ask you this. You just mentioned physics. So
14:02:07 in one of their areas of study, is a .05 p-value
14:02:11 considered acceptable or the standard?
14:02:13 A. The social sciences in general. I mean, all of the
14:02:17 social sciences. It's not like stats is some unique
14:02:19 thing. To all of them. And with all this like p-hacking
14:02:22 and stuff like that, I don't see how in the world you're
14:02:25 going to say you're going to get less p-hacking at a .1.
14:02:29 That's the whole thing is that all of these p-values,
14:02:31 they're an alpha, you set the alpha to a number. There's
14:02:34 nothing about -- you calculate a number in a sample. It's
14:02:41 a number that is unique to the sample. You could have
14:02:43 pulled a different sample, you'd get a different
14:02:45 calculation.

14:02:46 What's going on in statistics is that you could
14:02:49 have drawn over and over and over, over and over and over
14:02:53 different samples -- this is doing drawing samples -- you
14:02:55 could get a sample, do a calculation, all of them would be
14:02:57 different. You get a distribution of the numbers. Even
14:03:01 under the null, they'll be different. And so, since under
14:03:05 the Central Limit Theorem, those numbers as end goes to
14:03:10 infinity, they have a normal distribution.
14:03:13 The weird thing about a normal distribution, it
14:03:17 has infinite tails. So it's like a bell and it goes all
14:03:22 the way to infinity and the reason why that matters is
14:03:25 that the normal distribution says anything can happen.
14:03:31 Anything could happen. I could get a sample that finds
14:03:35 incredibly strong evidence for heat and mortality and it
14:03:39 is purely noise.
14:03:42 So what has to happen is that a statistician and
14:03:46 a researcher has to say, well, how big does the effect
14:03:49 have to be for me to say I don't think that this is coming
14:03:53 from the normal, .05. Why? Okay. What's the other
14:03:58 number? You've gotta pick a number. That's the whole
14:04:01 thing. You have to pick a number if you're going to do
14:04:04 confidence intervals. If you're going to quantify your
14:04:06 uncertainty about the estimate, you have to have a
14:04:08 decision rule.
14:04:09 And I did not hear Dr. Skarha say that we were

14:04:12 moving away from hypothesis tests. So I think -- I mean,
14:04:18 I don't know but I don't think anyone is seriously
14:04:20 considering abandoning hypothesis tests. That would be
14:04:25 insane.
14:04:28 Q. You told us some information you can share with us
14:04:32 about the article she brought in her deposition. You also
14:04:35 saw her talking about in her testimony today the articles
14:04:41 that you suggested in your rebuttal report, correct?
14:04:46 A. Sorry. Say that again. What?
14:04:48 Q. She mentioned during her deposition testimony
14:04:50 articles that you cited in your rebuttal report, correct?
14:04:50 A. Yeah.
14:04:54 Q. And I believe she said, well, there's an article in
14:04:56 there, Stefosia (phonetic) or something, I couldn't find
14:04:59 it. Do you remember that part?
14:05:00 A. Yes.
14:05:00 Q. Sitting here today, what could you tell us about
14:05:03 that?
14:05:03 A. It's an archive. The title goes to archive working
14:05:09 papers and it's got this particular number that if you go
14:05:13 to, it does come up, but it's a different set of authors.
14:05:17 So I must have just written down the wrong author set on
14:05:21 the paper and I don't exactly -- in my mind, I still see
14:05:28 Stefagoya (phonetic) in my head so I don't exactly know
14:05:30 why that would have happened. But the title and the

14:05:36 location of it is in the references are accurate. But the
14:05:41 author team has written about clustering and case
14:05:48 crossover and so, I must have -- my reference package uses
14:05:54 something called LayTec. You just cite it and then, it
14:05:57 brings it in. So I must be using a citation that knows
14:06:05 the paper and has the wrong author.
14:06:08 Q. Dr. Cunningham, you've covered a lot today.
14:06:10 Ultimately, can you tell us why you were so skeptical of
14:06:15 the JNO's conclusions?
14:06:20 A. I can't speak for the other guys on the team. I
14:06:25 think it's -- I think it really is two things. You're
14:06:35 never allowed to combine into a treatment or control group
14:06:40 units that have varying doses of treatment. It completely
14:06:45 makes it impossible to interpret the effects. So that's
14:06:47 one.
14:06:48 This whole movement around stuff, it's like, you
14:06:53 know, one or two sentences in the JNO and for me, because
14:06:58 I have this like -- because I've written this book on
14:07:00 causal inference and I've got a sequel to it and I teach
14:07:04 it at Harvard and I teach it at Baylor and I teach this
14:07:08 stuff like literally all over the world, it's like
14:07:12 borderline offensive. I mean, it's a nerd thing but it's
14:07:15 like it is so unbelievably inappropriate. And, you know,
14:07:22 I mean, someplace, that's why I would have loved to just
14:07:25 have a nice academic argument. You know, it's not that

14:07:28 she's unique in doing that. It's just that you shouldn't.
14:07:31 That's it. You just shouldn't do it. Especially when you
14:07:35 are options when you have a no, a full, and an
14:07:40 intermediate, you could have easily done case crossover
14:07:44 design like that. So that's one thing that drives me
14:07:46 crazy about it. When you do do it 013, the results go
14:07:49 bananas.
14:07:50 Q. When you say they go bananas, what do you mean?
14:07:52 A. Well, the -- okay. Here's some testable hypothesis.
14:07:57 If heat cause mortality, it probably should not have an
14:08:00 effect in the air-conditioned group. That seems
14:08:02 reasonable. That seems like a testable prediction.
14:08:05 That's how Karl Popper, the philosopher of science, that's
14:08:08 how he thought about making scientific statements. It's
14:08:11 not enough to just find something, it needs to have a
14:08:13 testable prediction.
14:08:15 Einstein's theory of relativity actually
14:08:20 predicted what would happen if star and light went around
14:08:22 the sun, and then, they did an experiment using a lunar
14:08:26 eclipse and it went exactly what he said. Sure. The
14:08:30 mathematical equations were incredible, but it's
14:08:33 incredible when a theory makes a testable prediction and
14:08:36 it's there, all right?
14:08:37 Well, so here's a testable prediction. If heat
14:08:40 is causing mortality in the Texas prisons, it should not

14:08:43 happen in the prisons where heat's not doing anything and
14:08:47 it is when you do the rearrangement. It finds the largest
14:08:50 effect. The largest positive effect is in the original
14:08:54 fully air-conditioned prisons, which are mostly hospitals.
14:08:58 Okay. So that's weird. That's weird. What
14:09:01 about over here? What about this group over here that has
14:09:04 no air conditioning at all. Says who? Says Dr. Skarha.
14:09:09 Why? Because she gave me the data. She gave me the
14:09:12 publication from the TPCA and the TPCA one of the
14:09:15 coauthors on the paper. So then I go, okay, I'll go over
14:09:18 to here. I'll go to this fully non air-conditioned group
14:09:21 of prisons, I'll run case crossover there. Surely, that
14:09:23 will be positive. It's not just that it -- it's not that
14:09:29 it's not statistically significant like, fine, we'll just
14:09:31 go to this one where we don't report confidence intervals
14:09:35 anymore. Okay. Fine. It's a zero. It's a zero on the
14:09:41 most dangerous, hottest prisons in the system that are old
14:09:46 as the republic.
14:09:47 Q. And why is that zero significant?
14:09:49 A. Because it should be there like if there is -- sorry
14:09:55 I'm getting worked up, but it's like if there is an
14:09:55 effect, why is it only amongst the partially incarcerated
14:10:00 prisons? Partially air-conditioned prisons? So it's just
14:10:03 like -- so then, see, this is the thing. It's like --
14:10:06 Q. Well, Dr. Cunningham, let me ask you this. I

14:10:09 appreciate you breaking it down for us.
14:10:10 A. Yeah.
14:10:11 Q. For people like me who have studied this and still
14:10:15 don't understand it, let me just ask you a baseline
14:10:17 question. In your expert opinion, how convincing do you
14:10:21 find this study?
14:10:21 A. The study's not convincing for me personally prior to
14:10:27 the study -- okay. At Thanksgiving, I just kind of like
14:10:33 went up to my parent -- went to my sister and I was like
14:10:35 if I told you that there's a study that finds -- okay.
14:10:45 I'm not supposed to say that?
14:10:45 MR. DUKE: Is this is hypothetical discussion
14:10:47 or --
14:10:47 THE WITNESS: No. It was a real discussion.
14:10:48 MR. DUKE: Object on hearsay.
14:10:51 Q. (BY MR MICKLE) Dr. Cunningham, let me ask you --
14:10:51 A. Okay. Fine. Prior to this study, if you had told --
14:10:57 prior to the study, all three of us, actually, all three
14:11:00 of us on the study thought that heat was causing mortality
14:11:07 in prisons. Why? Because it's so hot, it's summer.
14:11:17 Q. And now having ou reviewed the study, what is your
14:11:20 opinion?
14:11:20 A. My priors are lower that I know anything. That's
14:11:23 what it is. My priors, my prior beliefs have been
14:11:26 downgraded. Have been downgraded, which is not to say

14:11:29 that heat's not killing -- that doesn't mean that heat --
14:11:32 what I'm saying is that I am in a place that I never
14:11:35 thought I would be where I can confidently say I genuinely
14:11:39 do not think we have evidence for it. I think that study
14:11:43 needs to be done, though, but I just don't think she did
14:11:46 it.
14:11:46 Q. And that's based on your review of --
14:11:49 A. Yeah. It's based on my like I've never read a paper
14:11:52 -- in my history of 20 years, I've never read any paper
14:11:55 more than I've read this one.
14:11:56 Q. Thank you, Dr. Cunningham. I know it's not easy to
14:11:58 come and talk about another academic's work so I
14:12:01 appreciate your sharing your honest opinion. I pass the
14:12:02 witness, your Honor.
14:12:07 CROSS-EXAMINATION
14:12:07 BY MR. DUKE:
14:12:12 Q. I hope I can get as equally worked up about
14:12:16 statistics as you so we'll see. Thank you for your
14:12:18 testimony. I just have some questions to clarify some
14:12:21 things.
14:12:21 Just first, the study, Dr. Skarha's study, you've
14:12:27 referred to as the JNO study; is that right?
14:12:29 A. Correct.
14:12:29 Q. If I say Dr. Skarha's study or the 2022 study, you'll
14:12:35 know what I'm referring to which we can put it up,

14:12:37 Plaintiffs' Exhibit 70. Dr. Skarha's study was published
14:12:45 in 2022, 2023?
14:12:47 A. 2022.
14:12:49 Q. And so it's been four years. As far as you know, has
14:12:54 a single article or study been published that criticizes
14:12:57 her study?
14:12:58 A. I don't know of -- I didn't do that review.
14:13:01 Q. Or questioned her study?
14:13:02 A. I don't know. I didn't do that review.
14:13:04 Q. Would you be surprised that others have cited and
14:13:07 followed her study?
14:13:08 A. Oh, no, I wouldn't be surprised at all.
14:13:10 Q. Okay. You were retained, I think you testified to
14:13:14 this, simply to evaluate the 2020 study.
14:13:18 A. Correct.
14:13:18 Q. And like that study, you limited your review to
14:13:24 deaths through 2019?
14:13:26 A. Correct.
14:13:27 Q. You haven't looked at any deaths in TDCJ's custody
14:13:31 over the past six years.
14:13:33 A. Oh, yes. The suicide data. We have that ongoing
14:13:38 project I mentioned.
14:13:38 Q. Sure. But with respect to your testimony today and
14:13:41 the opinions that you intend on expressing, you're not
14:13:43 looking at or relying on any deaths in TDCJ custody over

14:13:47 the past six years.
14:13:48 A. To the best of my ability, we always chose to stop in
14:13:52 2019 because her paper stopped in 2019. I don't recall if
14:13:57 I ever did go beyond 2019 which I have no memory of. I
14:14:02 have no memory of it.
14:14:02 Q. Okay. But you didn't consider any of the actual
14:14:08 heat-related deaths from 2023, correct?
14:14:12 A. I didn't look at the 2023 deaths.
14:14:14 Q. Right. So if there was five deaths in 2023, that's
14:14:17 not something you considered at all as part of your
14:14:19 analysis.
14:14:20 A. The TJI data replicated her years.
14:14:24 Q. Okay. So is that a no?
14:14:25 A. Yeah. I did 2005 to 2019.
14:14:28 Q. So the fact that John Castillo died because of heat
14:14:33 stroke, that was not part of your analysis?
14:14:35 A. Wasn't part of mine. It wasn't part of the original
14:14:38 JNO either.
14:14:38 Q. Okay. But you're only reviewing the 2022 study.
14:14:41 A. Because I'm only reviewing the 2022 --
14:14:45 Q. Okay. I could go through the individual deaths that
14:14:48 we've talked about throughout this trial. None of those
14:14:49 actual deaths caused by heat or at least purportedly or
14:14:52 allegedly, whatever the other side would want to say,
14:14:55 caused by heat.

14:14:57 A. I see what you're saying --
14:14:58 Q. Has no effect whatsoever on your analysis.
14:14:59 A. Yes. No. I have not evaluated anything -- I have
14:15:02 only been hired to evaluate this study. Actually, I have
14:15:05 not been evaluated to come to any answer about heat and
14:15:09 mortality.
14:15:09 Q. Right. So you made a bunch of statements about -- a
14:15:14 series of assertions about effects and I think you meant
14:15:17 like effects on the statistical sense?
14:15:19 A. Yes but causal --
14:15:20 Q. Causal. But you weren't saying -- you weren't making
14:15:23 any conclusions about heat in Texas prisons and the effect
14:15:26 on mortality at all.
14:15:28 A. Correct. I was saying that having reviewed this
14:15:34 paper with it being the only paper about Texas-related
14:15:40 mortality that is causal in nature that I have reviewed,
14:15:46 my beliefs that we have evidence that heat and air
14:15:50 conditioning have any effect on Texas death prisons has
14:15:53 been downgraded.
14:15:53 Q. Okay. I understand that. But you didn't try to
14:15:56 determine whether extreme heat does, in fact, increase
14:16:00 mortality.
14:16:01 A. Correct. That's what we say in the report, too. We
14:16:03 have not been hired to do that.
14:16:04 Q. You didn't try to determine whether air conditioning

14:16:08 reduces mortality?
14:16:09 A. Correct.
14:16:09 Q. And you're not offering opinions on whether prisons
14:16:14 have suffered -- sorry. People in prisons have suffered
14:16:18 heat-related illness at all.
14:16:20 A. Correct. Yeah.
14:16:23 Q. And you don't dispute the extensive medical or
14:16:28 physiological evidence that prolonged exposure to heat
14:16:32 temperatures can be lethal?
14:16:33 A. No.
14:16:34 Q. You're not an epidemiologist.
14:16:36 A. Correct.
14:16:37 Q. You don't have any -- you don't have a degree in
14:16:42 epidemiology.
14:16:43 A. I do not.
14:16:43 Q. With respect to the case crossover analysis, you take
14:17:01 issue with her use, her use of the case cross
14:17:08 overanalysis; is that right?
14:17:08 A. I came to the conclusion that the case crossover
14:17:11 design may not be appropriate for this data set. But I
14:17:14 just want to say one thing. I am not taking issue with
14:17:17 her using it. It is a very -- I do think -- I can see why
14:17:23 she did it.
14:17:24 Q. So I appreciate and understand the nuance there. But
14:17:27 with respect to the use of case crossover analysis at all,

14:17:32 isn't it correct that this litigation will be the first
14:17:35 time that you would ever use case crossover?
14:17:37 A. Oh, yeah. This will be the first. Not the first
14:17:40 time I've run conditional logit/fixed effect regressions.
14:17:43 You know, we all get that training. That's what this is
14:17:46 is conditional logit/fixed effect regressions. Chris is a
14:17:50 panel fixed effects expert so I basically was waterboarded
14:17:54 with this stuff all through grad school. So it's not the
14:17:57 first time I've ever done any of these statistical
14:17:59 analyses. But case crossover as a design is very much a
14:18:03 biostats epi thing.
14:18:05 Q. Right. And so, because that's not your at least core
14:18:09 area of expertise.
14:18:10 A. I guess that's debatable. It's ultimately the
14:18:14 estimator is a maximum likelihood -- fixed effects
14:18:18 estimator and I would say I'm as competent and as skilled
14:18:20 at that as anybody. I just taught it a month ago.
14:18:23 Q. I'm not trying to question your competence. To a
14:18:26 certain degree, I'm just asking this is the first time
14:18:27 you've done a case crossover -- you assessed a case
14:18:30 crossover --
14:18:31 A. This is the first time I've called it a case
14:18:33 crossover so --
14:18:34 Q. Okay. Thank you. And then, so as far as the
14:18:36 underlying data, we heard you mention you disagreed with

14:18:39 the use of the BJS mortality databases; is that right?
14:18:43 A. With it exclusively and especially a '01 to '04.
14:18:47 Q. Did I hear you correctly that you believe that TJI
14:18:50 concluded that the BJS data was sporadic and inconsistent?
14:18:54 A. Yeah. It was not -- that was what I understood that
14:18:57 they were saying about the '01 to '04 years.
14:19:00 Q. And do you understand that TJI was only using that --
14:19:05 those words "sporadic" and "inconsistent" to describe the
14:19:08 Texas Office of Attorney General's data from before 2005?
14:19:12 A. I did not. I believe I had heard that it was that
14:19:15 there was also problems with the reporting to BJS, also.
14:19:19 Q. Right as to --
14:19:21 A. But it is not a complete panel.
14:19:23 Q. But it's because of the Texas Office of Attorney
14:19:27 General's data, not the BJS data on its own.
14:19:30 A. That would still be a problem with the MCI data that
14:19:34 it is missing key years of data.
14:19:37 Q. But do you understand that specifically, that
14:19:40 sporadic and inconsistent that you're attributing all of
14:19:42 BJS data is with respect to the Texas Attorney General's
14:19:45 data?
14:19:46 A. It is with respect to the MCI data set has selection
14:19:50 problems for 2001 to 2004.
14:19:53 Q. Do you know why?
14:19:56 A. I just know that it does.

14:19:59 Q. So what's your basis for that understanding?
14:20:06 A. TJI refuses to use it. UCLA and Arnold Ventures both
14:20:12 support that decision. TJI is the expert on Texas prisons
14:20:20 so there is something missing in the 2001 to 2004 that
14:20:25 raises questions about its usefulness in this project.
14:20:30 Q. Okay. You don't know what that is and you're just
14:20:33 relying on TJI?
14:20:34 A. Yeah. Relying on experts.
14:20:36 Q. Okay. If TJI -- if I can bring up the website, this
14:20:43 might help refresh your recollection about. If you read
14:21:56 the paragraphs regarding custodial deaths, does this help
14:22:00 you recall that it is the TDCJ still reported data to BJS
14:22:04 but the OAG -- the Office of Attorney General only
14:22:07 reported some of those deaths to OAG and so, because of
14:22:10 that, that's where the potential flaw in the data arose?
14:22:13 A. Okay.
14:22:14 Q. But it's not specific to BJS. It was more specific
14:22:17 to OAG?
14:22:17 A. Oh, right.
14:22:18 Q. Do you agree with that?
14:22:19 A. Well, yeah.
14:22:20 Q. Okay. That's all --
14:22:22 A. It's '01 to '04, though, is being excluded.
14:22:27 Q. Is being excluded from TJI, but there's still
14:22:30 reported deaths by TDCJ to BJS.

14:22:33 A. And missing deaths.
14:22:35 Q. Well --
14:22:36 A. That's what -- my understanding is that '01 to '04 is
14:22:42 not the universe of deaths and the quality of data only
14:22:46 improves starting later.
14:22:47 Q. According to TJI.
14:22:47 A. TJI, yes.
14:22:50 Q. But TDCJ still had an obligation to report those
14:22:52 deaths to BJS and --
14:22:57 A. Yeah, I guess if they had done it, then I'd been
14:23:00 using '01 to '04.
14:23:02 Q. What's your understanding that they didn't do it?
14:23:03 A. My understanding is that -- okay. What is my
14:23:06 understanding?
14:23:07 Q. Well. You don't have a basis to assert that they
14:23:09 being TDCJ weren't reporting those deaths to BJS. That's
14:23:13 all I'm trying to get at.
14:23:14 A. My understanding is that the reporting to OAG was
14:23:16 very spotty. It was unenforced, wasn't standardized even
14:23:21 though the law was there going back, I think, to the '80s.
14:23:24 They did not -- that's all I could really find was that
14:23:28 they were inconsistent in their reporting to it.
14:23:31 Q. With respect to state law reporting TDCJ to OAG but
14:23:36 not with respect to TDCJ's requirements under federal law
14:23:39 to report that data to BJS, correct?

14:23:42 A. And yet, TJI does conclude that '01 to '04 is the
14:23:46 weakest of the panel.
14:23:48 Q. I understand that. That's a completely different
14:23:49 question. TDCJ was still reporting the data to BJS,
14:23:54 correct?
14:23:54 A. Yes. They were reporting some of the data to BJS.
14:23:58 Q. So then, your comparison of your stress test result
14:24:03 with the 2022 study depends on your analysis of the TJI
14:24:09 data; is that right?
14:24:10 A. Right, which includes the MCI data.
14:24:12 Q. Correct. Right. And I think you testified that the
14:24:15 p-value of less than or equal to .5 is at least a number
14:24:20 that is generally agreed to show statistical significance;
14:24:25 is that right?
14:24:25 A. Yeah. It's a common decision role.
14:24:28 Q. You called it, I think, a conventional threshold for
14:24:32 statistical significance.
14:24:33 A. Uh-huh.
14:24:34 Q. So based on the power analysis that you discussed and
14:24:37 that you conducted, the sample size for the TJI mortality
14:24:41 data from 2005 to 2019 is not capable of detecting a
14:24:48 p-value of .05 at a 15 percent increase of deaths from
14:24:54 extreme heat in the summer in Texas.
14:25:00 A. You did the power simulation?
14:25:02 Q. I'm trying to like your power simulation.

14:25:04 A. Right. We're talking about the power simulation?
14:25:06 Q. Based off of the data that you used was incapable on
14:25:09 its face of making -- reaching a statistically significant
14:25:15 result.
14:25:15 A. Yeah. It was a simulation. Matched to the
14:25:19 distribution of heat. So the data set was using her heat
14:25:25 kind of, you know, properties and then, what we did was we
14:25:29 were just trying to say, you know, at what -- we would
14:25:33 just go through these simulations and we would have these
14:25:35 like number -- the size of the data set, we would say the
14:25:39 known effect size is this. At what point do you reach the
14:25:43 power of .8?
14:25:45 Q. Right. I'm going to try to simplify it but I can't
14:25:49 say these words. So the sample size that you used for
14:25:51 that analysis was too small, right?
14:25:55 A. To hit the power of .8.
14:25:58 Q. Right. You could never detect the 15 percent effect
14:26:01 for an extreme heat date using the sample size that you
14:26:05 chose for your analysis.
14:26:06 A. Never detect. What do you mean by that word?
14:26:08 Q. Well, you say that you need -- in your report, you
14:26:11 say that a sample size of approximately 2,250 deaths would
14:26:15 be required to achieve the conventional statistical power.
14:26:18 A. Yeah.
14:26:18 Q. But you use the data set with less than that. I have

14:26:24 them somewhere. 1,789 deaths, correct?
14:26:28 A. To reach the power.
14:26:30 Q. Right. But you use that data and the 1,789 sample
14:26:35 size was too small to ever reach a statistically
14:26:40 significant result.
14:26:40 A. Correct. To reach power.
14:26:40 Q. Right --
14:26:40 (Crosstalk.)
14:26:44 A. -- statistical significance and power are different
14:26:47 things.
14:26:47 Q. I understand they're different, but you were using
14:26:48 that result to determine whether or not the study that you
14:26:52 were evaluating was reliable.
14:26:54 A. Yeah. I was using -- that is how it's done.
14:26:57 Q. Right. But you were using a data set that was too
14:26:59 small to ever detect.
14:27:00 A. I was making up my own distinct set to do it.
14:27:03 Q. So then, you testified that the study was
14:27:06 statistically fragile; is that right?
14:27:07 A. Uh-huh.
14:27:08 Q. But isn't it true that by knowingly choosing a data
14:27:13 set with insufficient statistical power, you were
14:27:16 virtually guaranteeing that the result would be, in your
14:27:19 own words, statistically fragile?
14:27:21 A. So the way these simulations work, okay, so what

power means is what percent of the time am I going to pick this up for real, okay? .8 means four out of five. So you do the experiment over and over again. How often are you picking it up. You don't hit -- so that's what you're doing. You've done it a thousand -- I did it 500 times. I did the simulation 500 times. What percent of them am I getting the result when it's there? And it goes up as the sample goes up.

So that's what you're doing. You're basically -- some of the time I hit it. Some of the time, I do get it, 30 percent of the time, and it's not that that's like not real. It's just it's -- again, it's the flip side of that alpha .05. You say I want to pick it up four out of five times. Okay. And again, that's another threshold.

So you say I want to pick it up four out of five times, pick it up four out of five times I don't hit that point until just above her sample size for exactly the effects she reports. And if she uses the one from her first chapter, I have to go out even further. And if she starts dropping the hospitals, it's over.

Q. For each of those, are you using a different sample set, right? She used a larger number of deaths in Texas prisons than you did.

A. Okay. I do something 500 times, I flip a coin 500 times, 50 percent of the times, it should be heads.

14:28:47 That's what I'm doing.
14:28:47 Q. Using a smaller sample that was incapable of
14:28:50 producing a statistically significant result --
14:28:50 A. No. It's not incapable. It's the frequency with
14:28:54 which it occurs.
14:28:56 Q. Okay. Just to repeat one last tine, in your report,
14:28:59 you say a sample of approximately 2,250 deaths would be
14:29:02 required to achieve conventional statistical power.
14:29:06 A. Exactly.
14:29:07 Q. And the sample size that you use to run that analysis
14:29:10 was smaller than 2,250 deaths.
14:29:13 A. I explained it very well when I explained simulation.
14:29:16 I'm just going to end up repeating it --
14:29:18 Q. I'm just asking you that one question. You don't
14:29:20 need to explain --
14:29:20 A. Well, when you read it, that was what I said. But
14:29:22 when you read what I said, it wasn't what you said. So I
14:29:26 don't know what -- I either respond to myself, in which
14:29:29 case, I'm just going to quote that back or I'm just going
14:29:31 to say to you what you've misinterpreted it because you
14:29:35 don't understand that I'm doing a simulation.
14:29:37 Q. How about is it far less likely to ever achieve a
14:29:40 statistically significant result than using the data set
14:29:45 with the same number of deaths that Dr. Skarha used?
14:29:50 A. I'm just going to use the definition of power.

14:29:53 That's all I'm going to do. Every time you ask me, I'm
14:29:55 just going to use the definition of power because I'm
14:29:57 right on that. If you want to get it right four out of
14:30:00 five times, if you want to get it right four out of five
14:30:03 times, that's a .8. That's a .8. How big does the effect
14:30:09 size need to be? The smaller that the effect sizes are,
14:30:11 the bigger the data set needs to be. There's two parts to
14:30:15 this.
14:30:17 So she has teeny tiny effects size. That's why
14:30:21 this data set -- that's why we're even talking about
14:30:24 thousands of deaths. Why are we talking about thousands
14:30:27 of deaths? Because we're talking about .5 percent
14:30:31 increase on a rare event in the first place. Mortality.
14:30:36 So the only way in a simulation where it pops over and you
14:30:42 just happen to get lucky, 30 percent of the time, you only
14:30:46 get lucky 30 percent of the time to pick it up when it's,
14:30:52 you know, like down there.
14:30:53 So how do I get it so that I get where I'm not
14:30:56 lucky? Where I feel pretty good. 2,200. For her effect
14:31:03 size of .7, which you shouldn't even be doing in the first
14:31:06 place, you should be stating one that's like from the
14:31:09 literature. Well, she is the literature, frankly. She's
14:31:12 like when she wrote this, I don't think there was a lot of
14:31:15 stuff. So chapter one would be the .5 so that's what I
14:31:18 used. I have all of these curves. I think I go from like

14:31:24 .1 to 1.

14:31:25 And so, as you get down the smaller and smaller
14:31:27 effort sizes, the data set has to be bigger. She's at a
14:31:30 knife edge condition even before I start complaining about
14:31:37 the data set in the first place.
14:31:39 Q. Which is why I would actually like you to answer my
14:31:42 question.
14:31:43 A. I thought I did.
14:31:44 Q. I mean, you said you were responding with the
14:31:47 definition no matter what I asked. But I'm just asking
14:31:49 about the data set. You used a smaller data set, correct?
14:31:56 To run your power analysis, you used a smaller number of
14:31:59 deaths than Dr. Skarha did when she did her original
14:32:02 analysis of the effects on heat in Texas prisons with
14:32:07 respect to mortality, correct?
14:32:08 A. Okay. How a Monte Carlo simulation works is exactly
14:32:13 what you are complaining about. So I don't know how to
14:32:16 respond. I really don't. I feel like I've been clear.
14:32:21 Yes, I'm using a smaller data set and what it shows is
14:32:23 that you do not meet conventional power until you get to a
14:32:28 particular number.
14:32:29 Q. Okay. I think that perhaps answered my question. So
14:32:40 you mentioned hospital deaths.
14:32:42 A. Yeah.
14:32:43 Q. And I think you said it was weird that the AC group

14:32:48 which you -- it was weird that the AC group had a large
14:32:51 number of deaths to simplify what you said.
14:32:55 A. It's not weird that the AC group has a ton of deaths.
14:32:58 The AC group has a ton of hospitals so it has a ton of
14:33:01 deaths.
14:33:01 Q. Exactly, right? So like because the largest portion
14:33:03 of sickly, infirm individuals are more likely to die is in
14:33:07 hospitals, hospitals are universally air conditioned.
14:33:12 It's not weird that there's a lot of deaths in that
14:33:15 hospital group; is that right?
14:33:16 A. Correct. What's weird is that in the air-conditioned
14:33:23 prison that those air-conditioned people in the hospitals
14:33:25 are responding to heat indexes outside that are not making
14:33:29 it into the building. That is what is weird.
14:33:31 Q. Thank you for that clarification. So then, with
14:33:34 respect to the stress test that you did, as part of your
14:33:40 analysis, you had to match inmate deaths from that TJI
14:33:44 data set to specific prison facilities; is that right?
14:33:46 A. Yes.
14:33:47 Q. You talked about matching the address and you
14:33:50 documented those matches in a spreadsheet attached to your
14:33:53 report. Could we bring that up? This document is tab 7
14:34:07 and this is a very, very large Excel file, but is this the
14:34:12 Excel file that you used to do that?
14:34:14 A. I don't remember the name, but if that's what I gave

14:34:17 you.
14:34:17 Q. The name of the document, according to your report,
14:34:19 was Deaths With Prison Matches Version 2.csv?
14:34:23 A. I would think so.
14:34:26 Q. And in order to make this easier to look at today, we
14:34:30 tried to blow this up by hiding some of the columns to
14:34:33 show the death information. So we have tab 8, which is an
14:34:43 Excel file. It's still 400 pages but I think it will be
14:35:09 useful for what I wanted to look at.
14:35:12 And so, from a formatting perspective, can you
14:35:14 see that I have left nine of the columns remaining
14:35:17 visible?
14:35:17 A. What am I looking at? Match reason, match prison?
14:35:21 Q. Yeah. So this is basically your Deaths With Prison
14:35:24 Matches Version 2.csv with some of the columns converted
14:35:29 into a PDF to make it clear reading. So you can see that
14:35:33 I've left nine of those columns; is that right?
14:35:37 A. Yes.
14:35:37 Q. The match prison column shows the prison which you
14:35:43 attributed each specific death to, correct?
14:35:46 A. I think so.
14:35:47 Q. And you used the county, city and address columns
14:35:50 from the original data set to make that match.
14:35:53 A. I seem to think that. I'm trying to remember. I
14:35:56 think I had trouble with county and city and I had to use

14:35:58 both. I had to use a fuzzy match.
14:36:03 Q. I just want to make sure that I've correctly left all
14:36:06 of the original columns from the TJI data that you used in
14:36:10 matching your result.
14:36:12 A. I believe you specifically did.
14:36:15 Q. And this is an excerpt that appears to accurately
14:36:18 reflect the columns from your spreadsheet; is that right?
14:36:20 A. I think so.
14:36:21 Q. Okay. So you identified that .07 deaths could not be
14:36:25 matched; is that right?
14:36:27 A. What was the percent?
14:36:29 Q. .07 percent of the deaths?
14:36:31 A. Yeah, I think that I reported 99 successive match
14:36:36 rate.
14:36:36 Q. Yeah. I think you said the vast majority of matches
14:36:39 were correct?
14:36:39 A. Yeah.
14:36:41 Q. So that .07 you excluded from this chart.
14:36:45 A. I meant to.
14:36:46 Q. Okay. So one of the opinions you offered was that
14:36:49 the 2022 study mistakenly attributed some deaths to
14:36:54 majority air-conditioned facilities instead of non-air
14:36:58 conditioned facilities, and vice versa? Did I get that
14:36:59 right?
14:36:59 A. Say it again.

14:37:00 Q. That the study, the 2022 study mistaken attributed
14:37:04 some deaths to majority air-conditioned facilities instead
14:37:07 of non air-conditioned facilities or vice versa.
14:37:12 A. Do you have the quote of what I say?
14:37:17 Q. Yeah. You can bring up your report. It's DX-88 at
14:37:29 page 6. One of your criticisms of Dr. Skarha was that
14:37:48 there was a mismatch between units for individuals in air
14:37:54 conditioning versus non; is that right?
14:37:59 A. There was mismatch between units in air condition --
14:38:04 can I see my quote?
14:38:39 Q. Here's just one example. The underlined line, you
14:38:45 talk about the misclassification of air conditioning
14:38:49 versus non-air conditioning.
14:38:50 A. Oh. Yeah. Okay. This was what I was saying earlier
14:38:54 the misclassification. Right. Okay.
14:38:57 Q. I think the deposition, I don't have the quote in
14:39:00 front of me but you mention that. And we're looking at
14:39:07 page 13 of Exhibit 88. I think, also, you've mentioned at
14:39:19 deposition that Dr. Skarha mistakenly attributed some
14:39:22 deaths to units based off of your analysis that should
14:39:28 have been classified as either AC or not AC and that was a
14:39:31 issue with her data.
14:39:32 A. The partial. That conversation I just had about
14:39:33 doing the partial stuff?
14:39:34 Q. Correct.

14:39:35 A. Yeah. I disagreed with making partial either fully
14:39:41 or non, yes.
14:39:43 Q. And I think your criticism on page 6 of that same
14:39:51 document was that approximately 70 individuals were
14:40:07 misclassified as being in those particular units.
14:40:15 A. That's what I was left with, yeah.
14:40:19 Q. And so, did you know that -- and I think those 70
14:40:24 deaths, a portion of those were for the Hodge, Pack and
14:40:28 Skyview Units that you said should have been full AC?
14:40:32 A. More troubling, 70 deaths and without AC come from
14:40:35 three facilities that are hundred percent. Yeah. That's
14:40:41 what I said, yeah.
14:40:42 Q. You said 70 of those deaths were -- should have been
14:40:46 classified as full AC?
14:40:47 A. That's what I remember from the -- I don't have the
14:40:49 full but that's what it says in the document.
14:40:51 Q. Right. And so, you're using information that TDCJ
14:40:54 provided you that those units were fully air-conditioned?
14:40:58 A. That's from Dr. Skarha.
14:40:59 Q. No. But you're saying that those are classified as
14:41:01 non-AC but should have been classified as fully AC; is
14:41:05 that right?
14:41:05 A. No. This is from that TPCA document that Dr. Skarha
14:41:08 gave me. Actually, TDCJ never gave me anything. The Box
14:41:14 folder that you were given.

14:41:16 Q. So you're saying that because those units are
14:41:18 classified on the chart that the TPCA document that is --
14:41:23 they should have been classified as full AC?
14:41:26 A. Well, she said that. She gave me that file. She
14:41:30 says in the document that it is --
14:41:33 Q. Just to start over. The 70 deaths, you're saying,
14:41:37 should have been classified as full AC based off of the
14:41:40 information you were provided, but in fact, in her data,
14:41:42 they were classified as not full AC; is that correct?
14:41:46 A. Okay. Let me see the first part. You said -- I
14:41:50 think the second part you said is true which is that these
14:41:56 are -- this is that second data set that she gave me the
14:42:01 week after the report was turned in. In that second data
14:42:05 set, the without AC had this breakdown. 3.9 percent of it
14:42:14 when you went back at least as far as our coding it up,
14:42:19 maybe what you're saying is I miscoded it.
14:42:20 Q. Yeah. So that is what I'm saying because the Hodge
14:42:23 and Pack Units were not air-conditioned until after fiscal
14:42:28 year 2020. Were you aware of that?
14:42:30 A. In that document that we were given.
14:42:32 Q. No. I'm saying as a matter of fact, the units were
14:42:36 not air-conditioned until after fiscal year 2020 --
14:42:40 A. Oh, I mean I was going off what she gave us.
14:42:43 Q. You're looking at documents within the materials,
14:42:46 right, but you were assuming that those units should have

14:42:49 been classified as AC deaths when, in fact, they were not
14:42:54 air-conditioned at the time of the deaths prior to 2019.
14:42:57 A. I was assuming that what she gave me was accurate.
14:43:00 Yes.
14:43:00 Q. Oh, no. You said it was troubling, your analysis was
14:43:03 troubling that you identified these 70 deaths that seemed
14:43:07 to be misclassified. That's what your report says; is
14:43:10 that right?
14:43:10 A. If what you're telling me now is that even that
14:43:12 information that she gave me was inaccurate, then I'm even
14:43:15 more troubled again now I have even more
14:43:19 misclassification. Y'all gave me that data and it's in
14:43:22 the thing so, I mean, I don't know what -- this is --
14:43:22 (Crosstalk.)
14:43:27 A. -- again, getting back to the fact that there is no
14:43:29 transparent documentation that can allow a third party to
14:43:32 do it even when it's getting subpoenaed.
14:43:34 Q. Could you have made some mistakes in your analysis?
14:43:36 A. I could have, yes.
14:43:38 Q. So with respect to the documents then, I think you
14:43:46 said just now that Dr. Skarha maybe sent you incorrect
14:43:51 data files?
14:43:53 A. Well, she gave me data files that have changed.
14:43:58 Q. You got those files from -- through us but from
14:44:02 TDCJ's attorneys; is that right?

14:44:04 A. Correct. I got the original -- all sense is in one
14:44:08 in that original box folder and then, I don't remember the
14:44:12 name of the second one that came a week after December 11.
14:44:14 Q. And some of those files were not what you wanted; is
14:44:17 that right?
14:44:17 A. Not what I wanted?
14:44:18 Q. They were not what you were asking for; is that
14:44:21 right?
14:44:21 A. No, they weren't.
14:44:23 Q. Okay. Do you know that is because the TDCJ's
14:44:26 attorneys demanded that Dr. Skarha send them everything
14:44:30 she had in her possession, custody and control that had
14:44:33 anything to do with Exhibit 70 that 2020 study?
14:44:39 A. No. I'm not complaining about -- by the way, I
14:44:43 ignore stuff that -- well, no, I'm not complaining about
14:44:47 being given a box of stuff. I'm complaining about the
14:44:50 fact that apparently, now I'm giving -- so the data sets I
14:44:56 was given had things that were mislabeled is what I guess
14:45:05 I'm hearing now, and that they were not apparently the
14:45:11 Excel spreadsheet that I was given in that list. I'm
14:45:16 assuming it wasn't correct because a week later, y'all
14:45:19 gave me a different one.
14:45:21 Q. Okay. So if we were asked to provide every document
14:45:24 of any kind and every kind -- of any kind or character
14:45:29 whatsoever that could pertain to the study, that's not

14:45:32 what you were asking for.
14:45:37 A. I have no problem getting too much stuff. I have a
14:45:42 problem with getting the wrong stuff and then, not getting
14:45:45 clear documentation that lets me recreate the treatment
14:45:49 variable.
14:45:49 Q. I guess my question is how do you distinguish between
14:45:52 extra stuff, the wrong stuff, the correct -- like what
14:45:55 method do --
14:45:55 A. It's not hard. Like there's a right-hand side of
14:46:00 your air-conditioning file.
14:46:01 Q. Okay. So if the wording included version -- all
14:46:05 drafts, all notes, all versions whether final or not,
14:46:10 variables, data, coding, et cetera, like if that's what we
14:46:14 asked for, you got that, could you have misunderstood what
14:46:18 you received?
14:46:25 A. Well, okay. I think that I have enough
14:46:30 self-awareness to say that I can misunderstand anything.
14:46:34 So yes, it is entirely, absolutely reasonable to say that
14:46:38 I've misunderstood something. The fact that the
14:46:44 air-conditioning data was given to me and then, the report
14:46:47 was written with the clear documentation of the problems
14:46:50 and then, it is reversed, though, with the new Excel
14:46:56 spreadsheet does seem to suggest that something I was
14:46:58 given was inaccurate.
14:47:04 Q. Okay. You have mentioned before that you didn't get

any information about which units were air-conditioned or not from TDCJ; is that right?
A. Yeah.
Q. Did you ask TDCJ to tell you which prisons were air-conditioned or not?
A. We were trying to replicate her paper.
Q. Sure. But like wouldn't TDCJ be the best source of information regarding which of their units were air-conditioned and when?
A. Not with the purpose we had this conversation. The whole team had a conversation of exactly what is it we're going to do. It was absolutely on the table that one of the things we were going to do is just do our own study and we had all these different debates about it. But the thing I really wanted to do was this forensic audit. That's kind of the standard right now in replicability, replication of things is just all hands on the table, no fingers crossed. We have no stake in the matter. We don't even -- we were up front. So my thought what I kept pushing the guys on and they all agreed was all right. This is not a study about air conditioning. This is not a study about -- so that meant asking TDCJ for stuff was irrelevant.
Q. So to the extent that any of your testimony could be construed as an assertion with respect to heat in Texas

14:48:14 prisons, that would be a mis construction of your
14:48:16 testimony. You're simply testifying about whether or not
14:48:21 you agree with the conclusions or the process of Dr.
14:48:23 Skarha's study; is that right?
14:48:30 A. If somebody asks me what do I think about the study
14:48:35 having done all that I've done and I say I've downgraded
14:48:40 my beliefs to a place of less of more skepticism, I guess
14:48:48 it's up to the Court to decide if that's out of line to
14:48:52 say that.
14:48:53 Q. Okay. I'm not exactly sure that answered my
14:48:57 question.
14:48:57 A. I don't understand your question.
14:48:58 Q. My question is I believe your testimony is limited to
14:49:01 the study itself and nothing to do with conclusions about
14:49:06 the actual effects, the actual issues related to heat in
14:49:10 Texas prisons.
14:49:11 A. Yeah.
14:49:11 Q. Okay. So just to go back to what you did not do, in
14:49:15 fact, you said you were hired by TDCJ to testify in this
14:49:18 litigation. You were not asked to evaluate anything
14:49:20 beyond the study itself; is that right?
14:49:23 A. Yeah.
14:49:24 Q. And whatever you think of the study's conclusions,
14:49:26 you agree that the entire purpose of your field of
14:49:28 expertise is to evaluate whether it is credible, it is a

14:49:34 credible claim that one thing caused another thing as
14:49:42 opposed to just them being statistically, coincidentally
14:49:46 connected.
14:49:49 A. Yeah. Can you say that.
14:49:51 Q. I'm trying to quote you accurately because you've
14:49:56 described what causal inference, like what your area of
14:49:58 study is, and you described it as whether it is a credible
14:50:01 claim that one thing caused another thing as opposed to
14:50:04 just them being statistically, coincidentally connected.
14:50:10 A. That is my area of expertise.
14:50:11 Q. So you specialize in assessing these causal
14:50:16 inferences; is that right?
14:50:17 A. Yes. I specialize in at least teaching it, but yeah,
14:50:19 I'm doing it.
14:50:20 Q. I think you were a little humble earlier. Like you
14:50:23 literally wrote the book on this.
14:50:24 A. I wrote a book.
14:50:26 Q. Yo wrote a book but it's the one that's used as a
14:50:28 textbook on causal inferences.
14:50:29 A. People use it, yeah.
14:50:31 Q. I think you called it a best seller during your
14:50:33 deposition.
14:50:33 A. Tall smidget, though, but yeah, that's right. It's a
14:50:38 best seller in an academic world where people have to sign
14:50:42 books.

14:50:43 Q. Well, that's great. And in fact, you called -- and
14:50:45 this may not be humble but I still think is probably
14:50:48 accurate that you called it the standard now in social
14:50:51 scientists for studying the causal inferences.
14:50:53 A. My book?
14:50:53 Q. Yeah.
14:50:54 A. Yeah. Well, I've heard people say that, yeah.
14:50:59 Q. With all that said, since you were hired, since you
14:51:04 were contacted by TDCJ, you were not asked to determine
14:51:10 whether extreme heat increases mortality; is that right?
14:51:12 A. Oh, yeah. That's right. I have not. I don't know
14:51:15 exactly what the first thing was, but it was pretty clear
14:51:18 up front early on that I was only comfortable auditing the
14:51:21 paper.
14:51:21 Q. Right. And you weren't asked to determine whether
14:51:24 air conditioning reduces mortality.
14:51:25 A. Yeah.
14:51:25 Q. And at least for heat in mortality, I think you
14:51:28 called Dr. Skarha's work like a question of real
14:51:33 consequence.
14:51:33 A. Yes.
14:51:34 Q. You just said, recently, you think it should be
14:51:37 investigated?
14:51:38 A. I applaud her for doing it.
14:51:41 Q. Right. And so, let me take this another way. There

14:51:43 continues to be deaths in TDCJ's facilities that are at
14:51:47 least attributed to heat and heat-related causes, multiple
14:51:51 in the summer of 2023, more in 2024 and 2025, but still,
14:51:57 they have the expert. No one at TDCJ has asked you to
14:52:02 investigate whether or not there's a connection between
14:52:07 heat and mortality in their prisons; is that correct?
14:52:11 A. I have never been asked to do that study.
14:52:14 Q. And then, one last -- I mentioned before that you
14:52:17 said that other articles and studies had cited Dr.
14:52:23 Skarha's work?
14:52:24 A. Say that again.
14:52:25 Q. You said before that you assumed that other articles
14:52:30 and studies had cited Dr. Skarha's work?
14:52:32 A. Well, you asked me and said -- didn't you ask me if
14:52:35 it would surprise me and I said it wouldn't surprise me at
14:52:39 all.
14:52:39 Q. Okay. I just want to bring up one example as
14:52:46 PDX-594. This is a study published in GeoHealth by --
14:52:50 it's called Spatialtemporal Facility-Level Patterns of
14:52:59 Summer Heat Exposures, Vulnerability and Risk in United
14:53:02 States Prison Landscapes. Do you see that?
14:53:03 A. Uh-huh. Yeah.
14:53:04 Q. GeoHealth is a peer-review journal; is that right?
14:53:08 A. I've never heard of GeoHealth, but if you tell me
14:53:10 that it's a peer-reviewed journal because, you know, it

14:53:13 is, then it is. But there's about 10 billion journals and
14:53:19 I don't know all of them so I've never heard of this one.
14:53:22 Q. And I just want to show you page 14 under S. There's
14:53:45 a cite to the JNO study that we're discussing today,
14:53:49 right?
14:53:49 A. Yeah.
14:53:49 Q. And then, also, a subsequent one and plus one.
14:53:54 A. Yeah, by Dr. Skarha she signed herself.
14:53:59 Q. I'd like to move to admit Plaintiffs' 594.
14:54:03 THE COURT: Objection?
14:54:04 MR. MICKLE: Yeah, your Honor. I don't know what
14:54:06 this is. I don't believe Dr. Cunningham is familiar with
14:54:09 this. There's some sort of offer of proof on a second
14:54:12 study that Dr. Skarha -- Dr. Cunningham has not been asked
14:54:15 to look at previously. I'd love to hear --
14:54:19 MR. DUKE: This is just a piece of evidence he
14:54:19 said that he assumed that there had been articles citing
14:54:24 Dr. Skarha and this is an example of that and I think it's
14:54:26 important to show that the work that he's questioning has
14:54:29 been cited by others.
14:54:29 A. I think I said I would not be -- you had asked me --
14:54:31 I just thought it was agreed. I actually wasn't saying
14:54:34 that I knew. Just so the clarification, I wasn't saying
14:54:36 that I knew that anybody. I thought you had asked me and
14:54:38 I said, you know, it wouldn't surprise me. But it

14:54:42 wouldn't surprise me, it's a seminal paper.
14:54:43 MR. MICKLE: And, your Honor, my objection is
14:54:46 I've never seen this but, also, hearsay. If the Court
14:54:48 wants to take judicial notice that somebody else has cited
14:54:51 the JNO article, I have no objection to that. If this is
14:54:53 coming in specifically, I do have an objection.
14:54:55 THE COURT: Okay. I'll take judicial notice of
14:54:58 it.
14:54:58 MR. MICKLE: Thank you.
14:55:03 MR. DUKE: Sorry. One second.
14:55:04 THE COURT: Sure.
14:55:20 MR. DUKE: Thank you for your time, Doctor. No
14:55:24 more questions.
14:55:24 THE COURT: Any followup?
14:55:25 MR. MICKLE: No redirect.
14:55:27 THE COURT: Thank you very much.
14:55:29 THE WITNESS: Thank you, sir. Thank you, your
14:55:31 Honor.
14:55:31 THE COURT: Your next witness?
14:55:33 MS. CARTER: Defendant calls Dr. Austin De La
14:56:01 Cruz.
14:56:01 THE COURT: Before you take a seat, could you
14:56:03 raise your right hand to be sworn, please?
14:56:05 THE CLERK: You do solemnly swear or affirm that
14:56:05 the testimony which you may give in the case now before

14:56:05 the Court shall be the truth, the whole truth, and nothing
14:56:09 but the truth?
14:56:09 THE WITNESS: I do.
14:56:11 THE COURT: Please be seated.
14:56:12 AUSTIN DE LA CRUZ, called by the Defendant, duly sworn.
14:56:12 DIRECT EXAMINATION
14:56:12 BY MS. CARTER:
14:56:21 Q. Good afternoon, Dr. De La Cruz. Do you mind stating
14:56:24 your name for the record?
14:56:25 A. My name is Austin De La Cruz.
14:56:27 Q. And, Dr. De La Cruz, you've been hired as an expert
14:56:30 by TDCJ in this case, correct?
14:56:32 A. That is correct.
14:56:33 Q. You're not a medical doctor, are you?
14:56:37 A. No.
14:56:41 Q. Brian, do you mind putting up Exhibit 91 at page 21?
14:56:54 Is this a copy of your CV, Dr. De La Cruz?
14:56:57 A. Yes, this is.
14:56:58 Q. And it correctly identifies you as a Doctor of
14:57:02 Pharmacy?
14:57:03 A. Yes. That's correct.
14:57:05 Q. Where did you receive your pharmacy degree?
14:57:07 A. I received my degree from Texas Tech University
14:57:10 Health Sciences Center.
14:57:11 Q. And when did you receive it?

14:57:13 A. At 2014.
14:57:14 Q. So how long have you been practicing?
14:57:17 A. Twelve years.
14:57:19 Q. Do you have any board certifications?
14:57:22 A. Yes. I have my board certification in psychiatric
14:57:25 pharmacy that includes the study of psychiatric-related
14:57:29 medications and neurology-related medications as well.
14:57:32 Q. What do you consider your expertise to be in?
14:57:37 A. My expertise is in the study of psychiatric-related
14:57:41 medications so mental health, neurology-related conditions
14:57:44 and substance use disorders, how to use those medications
14:57:47 safely and effectively.
14:57:49 Q. Your Honor, at this time, I'd like to move to admit
14:57:54 Defendant's 91 at page 21 through 35. That's just his CV.
14:57:59 MR. SINGLEY: It being just a CV, no objection.
14:58:03 THE COURT: So admitted.
14:58:04 MS. CARTER: I'd like to admit Dr. De La Cruz as
14:58:06 an expert in pharmacology specializing in
14:58:09 psychopharmacology, medication safety, and
14:58:10 interdisciplinary mental healthcare.
14:58:13 MR. SINGLEY: I don't think he's been qualified
14:58:19 on interdisciplinary mental healthcare. No objection with
14:58:23 the rest.
14:58:24 THE COURT: All right. He'll be received.
14:58:29 Q. (BY MS. CARTER) Dr. De La Cruz, what is it you do

14:58:33 now?
14:58:33 A. So I'm currently a Clinical Associate Professor At
14:58:36 the University of Houston College of Pharmacy. I also
14:58:40 teach at University of St. Thomas, their nurse
14:58:42 practitioner program. I teach several courses there
14:58:46 related to psychopharmacology and neurobiology of
14:58:50 addictions. I also teach at Texas Tech University Health
14:58:52 Sciences Center for their nurse practitioner program as
14:58:55 well. I'm a Clinical Instructor at Baylor College of
14:58:57 Medicine, in addition to that. And I also practice at the
14:59:01 VA -- Michael E. DeBakey VA Medical Center as a clinical
14:59:06 psychiatric pharmacy specialist.
14:59:16 Q. And what do you do in your role as a clinical
14:59:19 psychiatric pharmacist at the VA?
14:59:20 A. So my main role is to see patients and assess their
14:59:24 mental health-related conditions. Usually, it's referral
14:59:29 from a prescriber, a referral from a psychiatrist. If the
14:59:34 patient needs to be started on a new mental health
14:59:36 medication and changed to a new medication or really
14:59:39 optimize the current medication that's on board. And so,
14:59:41 it's using the safety and effective use of these mental
14:59:46 health medications that's primarily my main role in my
14:59:48 practice.
14:59:48 Q. And, Dr. De La Cruz, you offered an opinion in this
14:59:52 case, correct?

14:59:53 A. Correct.
14:59:54 Q. And you reviewed some of the medications and
14:59:56 conditions of some of the deceased inmates in this case;
15:00:01 is that right?
15:00:01 A. That is correct.
15:00:01 Q. Do you see similar diagnoses at the VA Hospital that
15:00:05 you reviewed here?
15:00:06 A. Yes. All of my patients at the VA Hospital have a
15:00:10 mental health diagnosis. All of my patients have multiple
15:00:16 comorbidities. My patients at the VA are younger
15:00:18 generation now, in their early 20s, and I see Vietnam vets
15:00:21 into their 70s and 80s. So a lot of my patients also have
15:00:27 disabilities as well. So it's a wide range of patients.
15:00:30 In addition to that, my clinic is active in the
15:00:33 summer where I see patients June, July and August and I am
15:00:37 prescribing these medications in Houston, so they also
15:00:40 still have to deal with heat-related issues as well.
15:00:43 Q. Dr. De La Cruz, there was some testimony from another
15:00:50 witness, Dr. DeGroot, last week and he noted that he was
15:00:53 not a pharmacologist. What is a pharmacologist's role in
15:00:58 providing mental healthcare or healthcare in general?
15:01:01 A. And so, a pharmacologist's main role is to study the
15:01:03 medication. Once we ingest a medication and there's
15:01:08 several different pathways that the body breaks down this
15:01:11 medication and how the body and the medication work

15:01:14 together. Ideally, the medication offers some benefits
15:01:18 but there's always risks. There's always adverse effects
15:01:21 involved.
15:01:22 So a pharmacology is looking at the point of
15:01:25 entry when that medication enters our system until the
15:01:28 point of exit when that medication is fully metabolized.
15:01:31 So that includes the efficacious, the well-known cause
15:01:37 benefits, and the negative toxicology-related benefits as
15:01:40 well.
15:01:40 Q. Did you have any specific interest while you were in
15:01:51 pharmacy school?
15:01:51 A. Yes. So always had a interest in psychiatry. I
15:01:57 really do enjoy working with the veterans. I enjoy
15:01:59 working with individuals with mental health disorders and
15:02:02 treating them. In addition to that, I do have a interest
15:02:05 in toxicology and was almost going to become board
15:02:11 certified with toxicology. I chose psychiatry because
15:02:15 there's more face-to-face patient care.
15:02:17 Q. Have you ever taught courses that involved teachings
15:02:20 in toxicology?
15:02:21 A. Yes. So throughout pharmacy school, that is just the
15:02:25 basic teaching that we receive. If we're going to learn
15:02:28 about the medications' positive benefits, we definitely
15:02:32 have to learn about the medications' negative benefit --
15:02:34 or negative consequences as well. And that is still

15:02:38 something I teach to this very day in my courses.

15:02:42 I'm a -- the reason I was hired at University
15:02:45 Houston College of Pharmacy was to build their course on
15:02:49 clinical psychiatry and pharmacology and then, also, their
15:02:54 neurology course as well. And so, both of those main
15:02:57 courses that all 30 are pharmacy students have to take to
15:03:01 graduate, we learn about these positive benefits and these
15:03:05 negative consequences of these medications. So it would
15:03:08 not be appropriate for any pharmacist to not know the
15:03:10 toxicology of these medications.

15:03:14 And in addition to that, I also teach
15:03:18 toxicology-related principles at University of St. Thomas
15:03:22 and at University of -- or Texas Tech University Health
15:03:26 Sciences for their nurse practitioner programs.

15:03:30 Q. Again, Dr. De La Cruz, you're not a medical doctor
15:03:33 though, right?

15:03:33 A. No. I am not a medical doctor.

15:03:35 Q. Are you a pathologist?

15:03:36 A. No, I'm not a pathologist.

15:03:37 Q. Are you a medical examiner?

15:03:39 A. No. I'm not a medical examiner.

15:03:41 Q. So if I was to ask you about cause of death, what is
15:03:46 your role there?

15:03:48 A. My role would not be to determine cause of death. As
15:03:52 pharmacists, that's our limitation and that is well

15:03:55 defined that we are not trained to diagnose patients. We
15:03:59 are not trained to determine cause of death. But what we
15:04:03 can do is look at the chemical manifestations and look at
15:04:07 how these medications affected the body, determine if
15:04:11 these medications had any impact on the toxicology or the
15:04:14 mortality rates for those individual patients.
15:04:17 Q. And are you as a pharmacologist familiar with the
15:04:22 associated mortality rates in some of the conditions you
15:04:24 reviewed in this case?
15:04:24 A. Yes. All pharmacists should be when prescribing
15:04:29 medications and when filling medications as well.
15:04:35 Q. Are you knowledgeable of the mechanism of certain
15:04:37 drugs you prescribe?
15:04:39 A. Yes. That is an important. Mechanism helps us
15:04:47 dictate how these medications work. But mechanism also
15:04:51 help dictate adverse effects as well.
15:04:57 Q. Dr. De La Cruz, if someone overdoses on a certain
15:05:04 drug or medication, is pharmacology relevant to
15:05:07 understanding what happened?
15:05:08 A. Absolutely. Yes. Within pharmacology with mental
15:05:13 health medications, specifically, that should be one of
15:05:15 the first things that we think about with overdose.
15:05:19 Mental health medications, unfortunately, are the third
15:05:21 most commonly overdosed substance after analgesics, which
15:05:28 are medications used for pain, and common household

15:05:30 products.

15:05:31 So knowing that, for any prescriber, any
15:05:35 pharmacist, they should have a idea that if we are
15:05:38 treating individuals with mental health disorders that we
15:05:41 need to be mindful of how dangerous these medications can
15:05:45 be, and oftentimes, we will limit the amount of
15:05:47 medications that we give a specific patient if there are
15:05:51 suicidal ideations, if there are hoarding behaviors or if
15:05:55 there are past history of substance use disorder or
15:05:58 suicide attempts.

15:06:03 Q. Dr. De La Cruz, you've been in the courtroom today
15:06:06 for at least some of the witnesses, haven't you?

15:06:08 A. Correct.

15:06:08 Q. Do you agree that heat-related illness is real and
15:06:12 can be fatal?

15:06:13 A. Yes, without doubt.

15:06:15 Q. Do you know that TDCJ reported three deaths that may
15:06:20 have been contributed to by heat in 2023?

15:06:23 A. Yes, I'm familiar with those deaths.

15:06:26 Q. And do you disagree with the pathologists' findings
15:06:28 in those cases that heat could have been a contributing
15:06:32 factor?

15:06:32 A. No. In my report, I go more specifically into the
15:06:35 other conditions that were present. That's one of the
15:06:39 main things that a pharmacist needs to consider is

15:06:41 ensuring that we're looking at all of the data, all of the
15:06:44 information at hand. So I was opining on the specific
15:06:49 mortality rates associated with some of the substances
15:06:53 that were taken through an overdose. I was opining on the
15:06:57 mortality rates of seizures, of hyponitremia, all the
15:07:00 things that pathologists also noted in the autopsy
15:07:04 finding.
15:07:04 Q. And have you treated individuals with seizures or
15:07:09 hyponitremia before?
15:07:10 A. With seizures, yes, I do treat individuals with
15:07:13 epilepsy. Hyponitremia, that's not really within the
15:07:18 realm of psychiatric pharmacy so I would consider that
15:07:21 outside of my scope. However, hyponitremia is a common
15:07:25 adverse effect with our antidepressant medications, so
15:07:28 keeping that in mind, I have to definitely order labs to
15:07:32 measure sodium levels and ensure that the patient's
15:07:35 antidepressant worsening any electrolytes.
15:07:40 Q. Dr. De La Cruz, can certain drugs or medications --
15:07:43 and if I use the word "drug," do you understand that to
15:07:46 mean medications or illicit drugs?
15:07:48 A. Correct.
15:07:50 Q. Can certain drugs cause or contribute to hyperthermic
15:07:54 disorders?
15:07:55 A. Yes.
15:07:55 Q. Do all of them?

15:07:56 A. No.
15:07:56 Q. How do you know this?
15:07:59 A. It's very well established in literature that there
15:08:02 are multiple classes of medications, multiple individual
15:08:07 drugs that can lead to hyperthermia independently and that
15:08:10 is independent of the external environment. Oftentimes,
15:08:15 these medications can lead to issues in thermoregulation
15:08:19 with regards to our compensatory mechanisms for cooling
15:08:23 our body so they can interrupt the vasodilation proces.
15:08:29 They can inhibit sweating and oftentimes, these
15:08:32 medications -- or we see these thermoregulation changes,
15:08:37 they're commonly more found in doses that aren't
15:08:43 maintenance doses. Doses that are above the recommended
15:08:46 prescribed doses, but they still can happen with lower
15:08:49 doses with certain products as well.
15:08:52 Q. And for the medications that can affect the
15:08:57 thermoregulation system, do they impact the body in the
15:09:00 same way or at the same level?
15:09:02 A. No. There's various mechanisms, depending on what
15:09:06 specific medication you're talking about. Each medication
15:09:09 has its own unique chemical makeup, its own medicinal
15:09:13 chemistry in a way where whenever we're adjusting that
15:09:16 medication, it's binding to unique receptors ina unique
15:09:19 way. And just because medication's in the same class does
15:09:23 not mean that it is the same medication. There's

15:09:25 different benefits. There are different adverse effects
15:09:29 and definitely different monitoring parameters as well.
15:09:32 So I would not say that all medications just because they
15:09:36 cause a similar adverse effect are similar.
15:09:38 Q. And you mentioned the mechanism or the chemical
15:09:41 makeup. Is it important to know the mechanism of a
15:09:44 medication or its chemical makeup to determine risk?
15:09:47 A. Yes. That would be crucial into identifying what the
15:09:52 adverse effects even are or why they're showing up in the
15:09:56 first place.
15:09:57 Q. Brain, do you mind putting up Defendant's 55? Dr. De
15:10:12 La Cruz, do you see this chart that's titled Drug
15:10:14 Associated With Heat Stress?
15:10:16 A. Yes.
15:10:16 Q. And you see the types of drugs on the left column,
15:10:20 correct?
15:10:20 A. Correct.
15:10:21 Q. Do all of these medications affect the
15:10:23 thermoregulatory system in same way or at the same level?
15:10:27 A. No. All of these are different classes of medication
15:10:29 and affect them differently.
15:10:31 Q. Can you explain the different groups of medications
15:10:34 to the Court?
15:10:35 A. Sure. So we have anticonvulsants. These are
15:10:39 medications that we use primarily for epilepsy. We have

15:10:43 topiramate and zonisamide. These are well-known
15:10:47 medications that can inhibit sweating or decrease sweating
15:10:52 in an individual patient. This is through an interesting
15:10:55 unique pathway called carbonic anhydrase different than
15:10:59 what we see with some of our typical anticholinergic
15:11:02 agents.
15:11:03 Listed below, we have anticholinergic
15:11:07 medications. These, I would say that it's interesting
15:11:11 that they're classified as anticholinergics. That's not a
15:11:14 drug class. All of these other medications listed here
15:11:17 are drug classes because we have a mixture of different
15:11:23 agents within these. So I would say that these all have
15:11:27 anticholinergic properties and they all have different
15:11:30 anticholinergic properties. In addition to that, we see
15:11:34 antihistamines as well. And so, all of these medications
15:11:42 can potentially cause decreased amount of sweating that
15:11:49 can occur in individuals.
15:11:51 And just to explain a little bit more about what
15:11:53 anticholinergics are, acetylcholine is basically a
15:11:59 neurotransmitter within our central nervous system that
15:12:01 helps our body to tell it to sweat. It sends a chemical
15:12:05 signal to our sweat glands and this acetylcholine kind of
15:12:10 acts as a key and it goes to our sweat glands and unlocks
15:12:13 that lock and then, as a result, we start to sweat.
15:12:17 What happens with anticholinergic medications is

15:12:21 that these medications can actually kind of gum up the
15:12:26 lock and it doesn't allow that key to go in there and to
15:12:28 turn on the sweat glands to a certain extent. So that's
15:12:31 how anticholinergics specifically can work. The
15:12:34 antihistamines, these are primarily binding to our
15:12:38 histamine receptors, our H1 receptors in our central
15:12:42 nervous system. These have secondary anticholinergic
15:12:45 properties in that they can also interfere with our
15:12:50 muscarinic pathways and that can also inhibit or reduce
15:12:54 sweating.
15:12:55 Antipsychotics, it says "all" here.
15:13:01 Antipsychotics, yes, they all have potential
15:13:05 anticholinergic properties. They also have a potential to
15:13:08 cause issues in thermoregulations, but within the class of
15:13:13 antipsychotics, it's definitely variable. You can't just
15:13:17 group them all together.
15:13:18 Antidepressants, pretty much the same thing.
15:13:23 Yes, all of these antidepressants that are listed here
15:13:27 have more anticholinergic properties so they would have
15:13:31 more heat-related issues compared to some of our other
15:13:37 antidepressants. Antidepressants can also impact the
15:13:42 muscarinic pathways to a certain extent. Usually, we
15:13:46 don't see that until we see higher doses of agents, and
15:13:50 usually, this primarily occurs in the setting of serotonin
15:13:54 syndrome with overdoses of serotonin-related agents.

15:13:59 We also see lithium. This is a medication
15:14:02 primarily used for bipolar disorder. Lithium doesn't
15:14:07 really bind to or affect acetylcholine in any way so it's
15:14:14 independent of that. Lithium is a hundred percent
15:14:17 metabolized by the kidneys so you need proper kidney
15:14:20 function for that medication to work. So if anyone is
15:14:22 dehydrated, that could potentially increase lithium
15:14:25 concentrations and lead to adverse effects.
15:14:27 Beta blockers, basically, this can interfere with
15:14:32 the body's cooling mechanism so it can kind of drop the
15:14:37 blood pressure and that's the whole reason that we're
15:14:38 using beta blockers is for hypertension. When it drops
15:14:43 the blood pressure, a lot of times, the body can't as a
15:14:46 result vasodilate and bring that warm blood to the surface
15:14:51 so that we can sweat.
15:14:52 Calcium channel blockers kind of work that same
15:14:54 way. Diuretics don't also interfere with acetylcholine
15:14:58 receptor and have a secondary pathway in that they lead to
15:15:03 water diuresis. Basically, a lot of individuals will
15:15:09 urinate and that, in turn, can help lower the blood
15:15:12 pressure; but also, that can, in turn, can lead to
15:15:14 dehydration and further worsen heat-related issues. But
15:15:18 all of these agents listed here, even though they're in
15:15:20 the same class, they have variable effects. They have
15:15:25 different indications. They have different side effects.

15:15:27 They have different half-lifes. They have just -- yeah,
15:15:32 it's hard to group them as a class. We have to look at
15:15:36 each and every individual agent.
15:15:38 Q. And, Dr. De La Cruz, you use the key going into a
15:15:42 keyhole for anticholinergics. Do all of the medications
15:15:46 listed under anticholinergics gunk up the lock as much as
15:15:51 you said they would or as much -- do all of them gunk up
15:15:55 the lock at the same level?
15:15:56 A. No.
15:15:56 Q. And, Dr. De La Cruz, you noted that anticholinergics
15:16:00 are not -- they're not really a class of drugs; is that
15:16:03 right?
15:16:03 A. That's correct.
15:16:04 Q. If a drug has anticholinergic properties, can it be
15:16:08 considered an anticholinergic?
15:16:09 A. If a drug has anticholinergic properties, it can be
15:16:13 considered an anticholinergic, but that wouldn't be
15:16:16 accurate because we do have medications listed here for
15:16:22 urinary retention. We have medications here listed for
15:16:25 Parkinson's disease. We have medications listed under
15:16:28 anticholinergics that can help stop extrapyramidal
15:16:32 symptoms which are common with our antipsychotic
15:16:35 medications.
15:16:36 So within pharmacy, within pharmacology, I think
15:16:39 it's kind of an error to label medications as

15:16:43 anticholinergics because so many medications have
15:16:47 anticholinergic properties. Sertraline here is a
15:16:54 medication that has very minimal anticholinergic
15:16:56 properties. It is an anticholinergic? Technically, yes.
15:17:01 On paper, yes, it's an anticholinergic. Would I consider
15:17:05 it an anticholinergic? No, I would not.
15:17:07 And so, oftentimes, anticholinergics can be
15:17:11 mis-categorized depending just on how their receptors
15:17:15 work, but they're all very different. And so, it's
15:17:19 definitely important to ensure that we're looking at each
15:17:22 and every individual anticholinergic agent.
15:17:26 And then, also keep in mind that a lot of our
15:17:28 medications like sertraline, which I just mentioned, this
15:17:32 is an SSRI. It's a selective serotonin reuptake
15:17:37 inhibitor. A lot of practitioners even will believe that
15:17:41 sertraline is only acting on serotonin receptors and
15:17:44 that's inaccurate. Serotonin is a major factor because
15:17:49 that is where it's achieving its pharmacological benefit.
15:17:53 But also, in addition to that, SSRIs are binding histamine
15:17:58 receptors. SSRIs can potentially bind norepinephrine
15:18:02 receptors. SSRIs can bind acetylcholine receptors. SSRIs
15:18:07 can bind adrenergic alpha receptors. So we have to be
15:18:11 very cautious whenever we label medications just based on
15:18:14 one receptor that they're binding to and go more deeper
15:18:17 into what is that individual medication, what is that

15:18:21 half-life, was the patient even taking this
15:18:24 anticholinergic medication, were they compliant, at what
15:18:27 dose were they taking this anticholinergic medication, did
15:18:31 this medication that has an anticholinergic property, did
15:18:35 it have high lipophilicity. You need high lipophilicity
15:18:40 to cross over into the central nervous system, into the
15:18:43 brain. Was that individual taking other medications that
15:18:45 were also anticholinergic. Does that medication -- or
15:18:48 does that patient have any pharmacogenic-related factors
15:18:52 where maybe they're clearing these anticholinergics
15:18:57 rapidly.
15:18:58 So there's so many different variations in
15:19:00 pharmacy whenever it comes to how these medications work
15:19:04 rather than just grouping them all under one umbrella
15:19:08 term. So that's ultimately what I mean by the issue with
15:19:12 labeling everything as an anticholinergic.
15:19:14 Q. And, Dr. De La Cruz, were you in the courtroom
15:19:17 earlier when plaintiffs' counsel suggested to Dr.
15:19:20 Leonardson that their experts believe there's no such
15:19:22 thing as a highly active anticholinergic?
15:19:25 A. That would be incorrect and that's well established
15:19:29 in medical literature. There are medications that are
15:19:34 more anticholinergic than others. Anticholinergic
15:19:38 medications are a spectrum and so, to say that there are
15:19:43 no differences is just inherently not knowing the

15:19:46 pharmacology of medications. Some medications are full
15:19:52 agonists, meaning that they bind the receptor fully. Some
15:19:56 medications are partial agonists, they can bind. Some
15:19:59 medications are antagonist. In addition to that, there's
15:20:02 binding affinities and there's all of these other
15:20:05 parameters that we take into consideration with how these
15:20:08 medications work. So to say that is just not having an
15:20:12 idea of pharmacology, I guess. The basics of
15:20:16 pharmacology.
15:20:17 Q. So, Dr. De La Cruz, would it be accurate to say that
15:20:22 all anticholinergics will cause drug-induced hyperthermia?
15:20:27 A. No. That would be also very wrong to make that
15:20:31 statement because, like I mentioned, anticholinergics is a
15:20:35 spectrum and many, many different medications have
15:20:37 anticholinergic properties, but that doesn't necessarily
15:20:41 mean that as soon as someone takes an anticholinergic
15:20:44 medication or a medication with anticholinergic
15:20:47 properties, that they're going to walk outside and have a
15:20:50 heat-related event. Even some medications that have high
15:20:54 anticholinergic properties, there's still not a lot of
15:20:58 heat-related events with these medications.
15:21:00 So it's really patient-dependent, too. So one of
15:21:04 the things that I always like to tell my students is that
15:21:07 mechanism of action and mechanism does not equal
15:21:11 inevitability, meaning that just because this mechanism is

15:21:16 present, we should be mindful of it as pharmacists and we
15:21:19 should be counseling our patients, but that also doesn't
15:21:21 mean that we're going to tell the patient that this is
15:21:24 going to happen. That's not true. And so, we have to
15:21:27 know what is clinically relevant versus what is not
15:21:31 clinically relevant or maybe more so of a theoretical risk
15:21:35 when it comes to certain related adverse effects.
15:21:39 Q. I also want to talk specifically about
15:21:46 antipsychotics, Dr. De La Cruz. Does your report note how
15:21:49 often clinically meaningful temperature dis-regulation
15:21:55 occurs in severe hyperthermia cases?
15:21:58 A. Yes.
15:21:58 Q. And is that rare?
15:21:59 A. It's very rare with antipsychotics. Even though
15:22:03 antipsychotics have anticholinergic properties, we don't
15:22:08 see it that often unless we're seeing very extremely high
15:22:13 doses that are outside the normal reference range and in
15:22:16 the setting of overdose, then yeah, we will see
15:22:19 anticholinergic properties and thermoregulatory effects
15:22:23 that could lead to heat-related issues.
15:22:26 Q. And, Dr. De La Cruz, did you review an international
15:22:29 pharmacovigilance analysis of hyperthermia cases?
15:22:33 A. Yes, I did.
15:22:34 Q. Brian, do you mind pulling up Exhibit 168. Is this
15:22:38 that study, Hypothermia Following Antipsychotic Drug Use?

15:22:42 A. Yes, this is the correct study.
15:22:44 Q. And the title is "Hypothermia" but does the study
15:22:50 also analyze hyperthermia?
15:22:54 A. Yes, they do their study on hyperthermia as well.
15:22:57 Q. Do you know how many different reports they reviewed?
15:23:01 A. Yes. So just to go into more detail with this
15:23:05 pharmacovigilance study, one of the biggest ones I've seen
15:23:06 with regards to antipsychotics, they look -- this was an
15:23:09 international adverse event reporting study so in the
15:23:15 clinic as providers, as practitioners, as pharmacists, if
15:23:19 we're seeing patients, we should be mindful of the FDA
15:23:23 adverse event reporting system. If we have patients that
15:23:26 experience an adverse event that is uncommon, we should be
15:23:30 able to notify the -- and write a warning on that
15:23:37 medication that this individual experiences. And this
15:23:40 something that P&T committees, this is something that
15:23:43 hospitals can go through and see adverse events and
15:23:46 patients to make sure that they are being reported. So
15:23:49 it's checked at multiple levels.
15:23:52 But this study, in particular, there was looking
15:23:54 at 77 different countries. This was looking at 3.5
15:23:59 million different case reports and what they found was
15:24:03 that hyperthermia associated with antipsychotics was about
15:24:09 524, approximately, those cases. Hypothermia, which is
15:24:16 lower body temperature, was about 480 cases. And so, if

15:24:22 you look at those numbers, those are what we would call
15:24:27 not clinically significant, meaning that I wouldn't
15:24:31 necessarily not prescribed a medication for a patient
15:24:34 because it's hot outside, right? I think we have to weigh
15:24:38 the risk versus the benefits whenever it comes to any of
15:24:41 these medications that can affect thermoregulation in that
15:24:44 what is worse a patient that has major depression that's
15:24:49 severe with a past medical history of multiple suicidal
15:24:54 ideations, multiple suicidal attempts, or you're worried
15:24:58 about an adverse effect that could occur in .01 percent of
15:25:03 the population.
15:25:04 And so, that's ultimately what this study was
15:25:05 showing is that it's not clinically significant. Yes, on
15:25:09 the label, yes, in training, yes, in my classes, I teach
15:25:15 it because I want to cover all of my bases and ensure that
15:25:18 the students are aware that this can happen, but at usual
15:25:23 doses that we'll prescribe in our patients, we typically
15:25:26 don't see hyperthermia-related cases.
15:25:28 Q. Your Honor, at this time, I'd like to move admit
15:25:32 Defendant's Exhibit 168. That's Hypothermia Following
15:25:36 Antipsychotic Drug Use where Rob J. van Marum is the
15:25:40 leader author.
15:25:42 MR. SINGLEY: No objection.
15:25:42 THE COURT: So admitted.
15:25:44 Q. (BY MS. CARTER) Dr. De La Cruz, we've discussed

15:25:51 anticholinergics and the range of them, antipsychotics. I
15:25:55 also want to talk about an illicit drug synthetic
15:26:00 cannabinoids. Are you familiar with that?
15:26:01 A. Yes.
15:26:01 Q. Are you aware that it's commonly called K2 in the
15:26:06 correctional setting?
15:26:07 A. Yeah, K2 Spice, there's a lot of different names for
15:26:12 it. Unfortunately, I think that name kind of downplays
15:26:14 the severity and lethality of this substance. But yes,
15:26:18 that's what they refer to it as.
15:26:21 Q. How much is known about synthetic cannabinoids?
15:26:25 A. Unfortunately, not a lot. The DEA has a hard time
15:26:30 keeping up with these synthetic cannabinoids. What we do
15:26:33 know is that they're extremely potent. What we do know is
15:26:37 that they're lethal. What we do know is that there are
15:26:41 variations with different synthetic cannabinoids. Not one
15:26:46 synthetic cannabinoid is similar to another unless it's
15:26:50 from the same batch. But there's no oversight. There is
15:26:54 no manufacturing protocols whenever, you know, illicit
15:27:00 manufacturers are creating these substances, and
15:27:02 oftentimes, it's not just the K2 that's in that product
15:27:06 that they're smoking, it's combined with a lot of other
15:27:10 lethal substances.
15:27:12 Q. Dr. De La Cruz, you referred to different batches.
15:27:16 Are the batches chemically the same?

15:27:19 A. There's no way of knowing. Chances are no. It's
15:27:23 likely not the same. I guess, to go in further to your
15:27:28 first question about different synthetic cannabinoids, at
15:27:32 this time, the DEA has identified and the number of varies
15:27:37 from 200 to 400 different synthetic cannabinoids, but they
15:27:42 admit that there's likely well over a thousand and many
15:27:46 more.
15:27:46 What happens is that any time a new synthetic
15:27:49 cannabinoid is widely distributed, the DEA can state that
15:27:54 this is now a Schedule I controlled substance, which means
15:27:56 that there is no therapeutic benefit and it can be used
15:28:00 for illicit purposes so it should not be distributed, and
15:28:04 individuals who are caught with a Schedule I controlled
15:28:07 substance can face jail time.
15:28:09 One way to stay ahead of the DEA is to possibly
15:28:13 add a Hidrox, now it's an entirely different formulation.
15:28:17 Now it's different than the previous medications that now
15:28:21 have a Schedule I designation. The problem with messing
15:28:25 with chemistry, ask any medicinal chemist, ask any
15:28:33 pharmacologist, just one little change to a medication is
15:28:38 going to change dramatically how that medication works in
15:28:42 the body. Not medication, sorry. Illicit substance works
15:28:45 in the body and can be the difference between life and
15:28:48 death.
15:28:51 Q. Are you familiar with 5F-ADB?

15:28:59 A. Yes.
15:29:00 Q. What is that?
15:29:01 A. So 5F-ADB is another one of the synthetic
15:29:04 cannabinoids. This is one of the most common ones that we
15:29:08 see now, unfortunately, is the most lethal synthetic
15:29:13 cannabinoid out there.
15:29:14 Q. So there are independent lethality levels with that
15:29:18 synthetic cannabinoid?
15:29:20 A. Oh, without that doubt, yes. That has been shown
15:29:22 throughout medical literature that this particular
15:29:25 substance and all synthetic cannabinoids can lead to
15:29:28 cardiac arrest. These can lead to respiratory distress.
15:29:31 These can lead to sudden death. These can lead to
15:29:35 seizures. So the negative outcomes are, yeah, widely
15:29:40 known.
15:29:40 Q. And did you review any literature about this specific
15:29:43 synthetic cannabinoid?
15:29:44 A. Yes.
15:29:45 Q. Brian, do you mind putting up Defendant's 171? Is
15:29:50 that this document, Dr. De La Cruz, Detection And
15:29:53 Quantification of 5F-ADB And Its Methyl Ester Hydrolysis
15:30:01 Metabolite In Fatal Intoxication Cases By Liquid
15:30:02 Chromatography High-Resolution Mass Spectometry?
15:30:05 A. Yes. That's correct.
15:30:06 Q. And what does this study show about that chemical

15:30:15 makeup of synthetic cannabinoids?
15:30:17 A. Yeah. This one, in particular, shows just how more
15:30:22 potent this 5F-ADB is compared to just general marihuana.
15:30:30 So what marihuana does is whenever someone smokes it,
15:30:35 inhales it, it binds to our CB1 receptor that are located
15:30:39 throughout our body. This can lead to some mild euphoria,
15:30:42 relaxation effects. What these substances, illicit
15:30:47 substances are doing, instead of the partial agonism, like
15:30:51 I said, with a lot of receptors, a lot of medications will
15:30:54 kind of go on and off, not fully binding. These synthetic
15:30:58 cannabinoids are full agonists of our CB1 receptors. Not
15:31:04 only that, if we think about potency, this specific
15:31:09 literature mentions about the lethality in more detail
15:31:15 saying that it is 290 times more potent than usual
15:31:19 marihuana.
15:31:20 So anytime we worry about any illicit medication
15:31:25 even -- or illicit drug two times is still concerning but
15:31:29 290 times further just paints that picture of lethality
15:31:34 for these substances.
15:31:35 Q. Your Honor, at this time, I move to admit Defendant's
15:31:37 171.
15:31:38 MR. SINGLEY: No objection.
15:31:39 THE COURT: So admitted.
15:31:43 Q. (BY MS. CARTER) Dr. De La Cruz, did you review any
15:31:44 literature about synthetic cannabinoid use in prison,

15:31:47 specifically?
15:31:48 A. Yes.
15:31:48 Q. Brian, do you mind putting up Defendant's 173? Is
15:31:52 that this document Synthetic Cannabinoids Deaths In State
15:31:56 Of Florida Prisoners?
15:31:57 A. That's correct.
15:31:57 Q. And what state, obviously from the name, did this
15:32:01 prison -- did this study review?
15:32:03 A. Yes. This is from the state of Florida.
15:32:05 Q. And do you know how many synthetic
15:32:08 cannabinoid-involved deaths were recorded between March
15:32:11 2017 and November 2018?
15:32:12 A. I think around approximately 50 or so.
15:32:18 Q. At this time, your Honor, I'd move to admit
15:32:20 Defendant's 173.
15:32:22 MR. SINGLEY: No objection.
15:32:22 THE COURT: So admitted.
15:32:24 Q. (BY MS. CARTER) Dr. De La Cruz, you've testified that
15:32:28 synthetic cannabinoid receptor agonist is SCRA, right?
15:32:33 A. Correct.
15:32:33 Q. And how does that affect the respiratory system?
15:32:36 A. Yes. So we have cannabinoid receptors, like I
15:32:40 mentioned, all over our body. We also have cannabinoid
15:32:43 receptors in certain areas of our brain that are required
15:32:47 to allow us to perform normal functions to live. For

15:32:53 example, on our brainstem, our medulla, this is our area
15:32:58 of the brain that's responsible for telling us to take a
15:33:02 breath, telling us to inhale more oxygen. And so,
15:33:06 oftentimes, what these synthetic cannabinoids can do is
15:33:11 interfere with those chemicals signaling and that's why we
15:33:16 do see respiratory distress with these specific synthetic
15:33:21 cannabinoids.
15:33:21 Q. Dr. De La Cruz, does the illicit drug fentanyl have
15:33:26 its own respiratory distress associations?
15:33:29 A. Yes. That is widely known. Fentanyl is an opioid
15:33:35 analgesic medication that's used for pain. This is one of
15:33:40 the most potent, one of the most illicit opioids out there
15:33:46 on the streets and has the highest mortality rates
15:33:50 compared to any other opioid. Very similar to synthetic
15:33:55 cannabinoids but at much higher rates as it will inhibit
15:34:00 or prevent your body's drive to breathe.
15:34:05 And so, what happens normally is that our
15:34:11 medulla, our area of our brainstem can sense whenever
15:34:14 carbon dioxide levels in our body get too high and it's a
15:34:19 fine balance. And so, if carbon dioxide gets too high,
15:34:23 our medulla tells us it's to take a breath, it's time to
15:34:26 get in more oxygen to balance that out. So what happens
15:34:29 with fentanyl, specifically, is it turns off that signal.
15:34:32 So carbon dioxide builds up and these individuals are not
15:34:36 able to breathe and that's why lethal fentanyl

15:34:44 intoxications are just so common. On average per year,
15:34:47 there's about a hundred-thousand deaths, according to the
15:34:52 the Center For Disease Control, from opioids. Fentanyl
15:34:55 makes up roughly about 80 percent of those death.
15:35:00 Q. Dr. Le La Cruz, if I was to hold my pen up like I am
15:35:03 now, can you indicate how large of a fentanyl substance
15:35:07 would be a lethal rate or a lethal level?
15:35:09 A. It would be the very fine point of that pen right
15:35:14 there.
15:35:14 Q. And, Dr. De La Cruz, did you review any literature
15:35:17 that indicates that synthetic cannabinoids like 5F-ADB can
15:35:27 exacerbate that fentanyl-related respiratory distress?
15:35:27 A. I'm sorry. Can you please repeat the question?
15:35:32 Q. Did you review any literature that indicates the use
15:35:34 of a synthetic cannabinoid can exacerbate fentanyl-related
15:35:38 respiratory distress?
15:35:40 A. Yes. That's correct. So that is what we would call
15:35:42 an additive effect in pharmacy where both of these
15:35:46 products can lead to worsening outcomes. So it's
15:35:51 basically like adding on more weight to a bench press.
15:35:56 With fentanyl or with 5F-ADB, you have 25-pound plates on
15:36:03 either side. But with fentanyl, now you're adding on a 45
15:36:08 plate. So it's worsening the outcome. It's making it
15:36:12 more difficult than it would be for that individual to
15:36:17 just breathe.

15:36:19 Q. Brian, do you mind displaying Defendant's 174? Is
15:36:25 that the study Synthetic Cannabinoid Receptor Agonists
15:36:30 Exacerbate Fentanyl-Elicited Respirator Depression And
15:36:33 Confer Resistance To Naloxone Rescue In Mice?
15:36:36 A. Yes. That is correct. And that is the scary thing
15:36:39 is that we don't have enough data to have this controlled
15:36:45 study in humans so we have to resort to animal studies
15:36:48 because oftentimes, toxicology reports aren't taken for
15:36:55 most overdose cases. And so, the problem with naloxone is
15:37:01 this is our rescue medication. This can help displace,
15:37:05 this can help throw fentanyl off the receptors and allow
15:37:11 us to breathe. But now we have two products together
15:37:14 which is ignoring our only life-saving treatment that
15:37:19 every single EMS provider carries with them.
15:37:23 Our attorney general made a statement that every
15:37:27 single individual should be carrying naloxone to show and
15:37:31 highlight the lethality of opioids. I think the last
15:37:35 attorney general statement was that you shouldn't drink
15:37:39 alcohol while pregnant. So all of these are very
15:37:41 important from a population base so that people understand
15:37:45 the risks that are inherent with these specific opioids.
15:37:49 Q. And, your Honor, at this time I'd move to admit
15:37:51 Defendant's 174.
15:37:53 MR. SINGLEY: No objection.
15:37:53 THE COURT: So admitted.

15:37:55 Q. (BY MS. CARTER) Dr. De La Cruz, do you recall about
15:37:58 how many individual medical records or autopsies you
15:38:01 reviewed in this case?
15:38:03 A. I believe it was 11.
15:38:06 Q. In the cases you reviewed, did you identify other
15:38:09 medical conditions that have high mortality rates
15:38:12 associated, regardless of ambient temperature?
15:38:15 A. Yes.
15:38:15 Q. Did you identify other medications that have
15:38:18 independent high mortality rates aside from outside
15:38:25 temperatures?
15:38:25 A. Yes.
15:38:27 Q. Are these conditions recognized in mainstream medical
15:38:34 literature as independently life threatening?
15:38:36 A. Yes. That has been well established.
15:38:38 Q. Dr. De La Cruz, in your experience, prescribing
15:38:53 certain medications, are elevated body temperature
15:38:56 specific only to external environmental heat?
15:38:59 A. No. That's not correct.
15:39:04 Q. What other times do high temperatures occur?
15:39:07 A. In the setting of overdoses, specifically, if we look
15:39:11 at what medication, there are quite a few medications when
15:39:16 taken outside the normal prescribed range can lead to
15:39:21 hyperthermia. That can occur with serotonin syndrome.
15:39:26 That can occur and that primarily happens with our

15:39:29 antidepressant medications. That can happen with
15:39:33 neuroleptic malignant syndrome. That happens with our
15:39:36 antipsychotic medications. That could happen in the
15:39:39 setting of seizures. Whenever someone has a seizure, all
15:39:43 of the muscles in the body contract rapidly, violently
15:39:48 over and over and over again. It's like running a
15:39:51 marathon within a few seconds. Unfortunately, some people
15:39:55 have seizures that last much longer so because of that,
15:39:59 you're contracting your muscles that is going to generate
15:40:01 massive amounts of heat.
15:40:04 And so, in addition to that, we see elevated body
15:40:08 temperatures in the setting of infections. The body
15:40:11 naturally uses its own body heat to increase to try to
15:40:19 kill the pathogen to make it more of a hot environment for
15:40:24 that. So that can all happen in air-conditioned
15:40:29 environments and that's something that we see commonly
15:40:34 across the board. Independent of external environments.
15:40:39 Q. Dr. De La Cruz, do you recall reviewing the medical
15:40:43 records of inmate John Southards?
15:40:48 A. Yes, I did.
15:40:48 Q. And what do you recall about his mental health
15:40:50 history?
15:40:51 A. Mr. Southards had a pretty significant mental health
15:40:55 history. He was severe major depression. In addition to
15:40:59 that, he had several attempts with suicide. There was a

15:41:06 past medical or past history of substance use as well.
15:41:11 The most recent suicide attempt was two weeks prior to
15:41:16 date of his death where they believed that he tried to
15:41:20 overdose on carbamazepine which was not a prescribed
15:41:24 medication for him, and that was actually the same
15:41:29 medication that was found in his system as well during the
15:41:34 toxicology reports on his death.
15:41:37 Q. Was diphenhydramine also found?
15:41:40 A. Diphenhydramine was the only prescription product
15:41:43 that was found in Mr. Southards' blood. Another
15:41:51 medication that was to the prescribed to him that was
15:41:53 found on the toxicology was Desmethylsertraline, which is
15:41:58 basically the metabolite of sertraline, and that tells us
15:42:01 that he was also taking sertraline that was not his at
15:42:04 high concentration. So the hoarding behaviors that were
15:42:10 noted prior to his death was also relevant during that
15:42:13 time that he died.
15:42:20 Q. Did you review a case report diphenhydramine overdose
15:42:24 with profuse sweating?
15:42:25 A. Yes. There were multiple case reports actually with
15:42:29 diphenhydramine causing profuse sweating.
15:42:31 Q. Brian, do you mind displaying Defendant's 170. Is
15:42:35 this an example of one of those case studies?
15:42:37 A. Yes.
15:42:38 Q. And your Honor, at this time, I move to admit

15:42:41 Defendant's 170.

15:42:42 MR. SINGLEY: No objection.

15:42:43 THE COURT: So admitted.

15:42:44 Q. (BY MS. CARTER) What else did this case study note as
15:42:50 symptoms from overdose?

15:42:51 A. Yeah. So with diphenhydramine, they noted
15:42:55 diaphoresis, which basically means sweating. They noted
15:42:58 myoclonus. This is basically muscle twitching. And they
15:43:03 noted muscular rigidity. This is where the muscles get
15:43:06 very rigid in a setting. Plus serotonin syndrome, which
15:43:11 is what all of these signs and symptoms portray.

15:43:17 Q. And did you review the diphenhydramine concentration
15:43:20 in Mr. Southards' case?

15:43:22 A. Yes, I did.

15:43:23 Q. Was it 6.3?

15:43:24 A. Yes, it was 6.3 micrograms per milliliter, which is
15:43:29 past the legal limits.

15:43:32 Q. And, Dr. De La Cruz, do you recall Dr. Uribe and his
15:43:36 report commenting that this was a low range?

15:43:38 A. Yes, I do remember Dr. Uribe saying it was on the low
15:43:42 end of the lethal range, which isn't appropriate when
15:43:46 we're evaluating toxicology reports. There is no low
15:43:50 lethal range. Once you cross a lethal range, then we
15:43:54 are -- you know, well-established studies have shown that
15:43:58 these individuals have a very high likelihood of passing

15:44:01 away.

15:44:02 In fact, diphenhydramine studies have shown
15:44:06 overdoses, lethality as low as .3 and he was 6.3. And so,
15:44:12 one of the findings from the reports was that the average
15:44:18 diphenhydramine overdoses were 15 micrograms per liter.
15:44:23 So his was a lot lower than the average, but that's not
15:44:27 the way that we should be assessing patients. Once you
15:44:30 cross that lethal threshold, that's indicative of a lethal
15:44:34 overdose and that is basically like saying that if a
15:44:39 bridge is built to withhold, you know, maximum
15:44:44 hundred-percent capacity based on X amount of weight and
15:44:47 then you are to -- you decide to drive a whole fleet of
15:44:52 18-wheelers that's 25 percent over that maximum amount of
15:44:56 weight, that the engineers, that every one on the
15:45:00 construction team decided that this bridge will not hold
15:45:02 if you exceed this weight. But a whole fleet, 25 percent
15:45:06 over that bridge shows just how significant 25 percent can
15:45:12 be even in lethal concentrations. I know I wouldn't trust
15:45:15 that bridge to go over that within that fleet of
15:45:18 18-wheelers. And so, I don't think that's appropriate to
15:45:22 compare lethality compared to other case reports. Every
15:45:26 individual patient's different.

15:45:28 Mr. Southards was found with 10 capsules -- 10
15:45:34 50-milligram capsules of diphenhydramine so no telling how
15:45:39 much he actually ingested. But because of the hoarding

15:45:43 behaviors, because of the fact that carbamazepine and
15:45:48 sertraline was present in his toxicology indicates that
15:45:51 this was an overdose as also reflected in the autopsy
15:45:55 findings from the pathologist as well.
15:45:56 Q. So the pathology just noted it was likely an
15:46:00 overdose?
15:46:00 A. Correct. I was not making a diagnosis. That was
15:46:02 well established already.
15:46:03 Q. And, Dr. De La Cruz, did you review any literature
15:46:06 that associates fatal intoxications diphenhydramine and
15:46:11 suicide?
15:46:11 A. Yes.
15:46:14 Q. Defendant's 175, is that this document, Dr. De La
15:46:18 Cruz, Poisonings With Diphenhydramine, A Survey of 68
15:46:22 Clinical And 55 Death Cases?
15:46:24 A. That's correct.
15:46:24 Q. Your Honor, at this time, I'd move to admit
15:46:27 Defendant's 175.
15:46:29 MR. SINGLEY: No objection.
15:46:30 THE COURT: So admitted.
15:46:33 Q. (BY MS. CARTER) Dr. De La Cruz, do you recall in Dr.
15:46:40 Vassallo's rebuttal report, she claims she saw thousands
15:46:42 diphenhydramine overdoses and none of them were lethal or
15:46:49 sweating?
15:46:49 A. Yes, I do recall that. I think that right there is

15:46:52 what we call availability bias and I noted that multiple
15:46:55 times throughout Dr. Vassallo's reports where she said,
15:46:57 I've never seen it so, therefore, it must not exist.
15:47:02 That's not how you approach medicine. That's not how you
15:47:05 approach managing patients. Outside of her view of what
15:47:13 she sees in clinical practice, that's why we rely on case
15:47:16 reports to see, you know, what else is going on outside of
15:47:21 just what we see in our own practice.
15:47:24 So I did note that specifically with this case
15:47:27 and with other cases as well. But Dr. Vassallo was also
15:47:30 wrong here in that if you know the pharmacology
15:47:34 diphenhydramine, yes, this is an antihistamine. That is
15:47:38 well-known. But like I mentioned before, a lot of
15:47:43 medications work on other receptors. So sometimes it's
15:47:47 not appropriate to just categorize a medication just based
15:47:51 on its receptor. We have to look at that one individual
15:47:54 medication. Diphenhydramine in pharmacology, we would
15:47:58 refer to that as a dirty drug. And a lot of our other
15:48:02 drugs throughout the central nervous system are dirty
15:48:04 drugs and that means that they do not adhere to their
15:48:07 receptor in overdose-related situations.
15:48:10 Diphenhydramine is pier to its receptor with
15:48:14 regards to the normal doses that an individual may take
15:48:18 for allergies or the normal doses that an individual may
15:48:21 take for insomnia, but once you cross that threshold and

take too much, it no longer is selective to histamine receptor. It starts to actually act like an SSRI and it starts going out and binding to serotonin receptors and inhibiting those receptors, and that's why you see an increase in serotonin and that's why you can, as a result, see serotonin syndrome with the medication that's supposed to be antihistamine.

And so, having a good idea of the pharmacology, you will know that you shouldn't just categorize the medication based on its primary mechanism. You still have to know what else is going on and look at the big picture and see, okay, well, if this medication is taken in an overdose setting, what other receptor is it binding to and the other receptor it's binding to is serotonin.

And so, what are the side effects that we see with serotonin syndrome? First off, we see sweating and so, that is a well-known side effect. The other side effect that we see is autonomic instability. Autonomic instability basically means that our body can no longer control our own temperature. So blood pressure increases, hyperthermia increases independent of environment and that's just because serotonin is a good thing but only to a certain extent, right?

We all want serotonin. It's the happy chemical. It keeps our mood stable. But one of the things that I

15:49:55 learned during my first year in pharmacy school that I
15:49:58 continue to teach my students on a day-to-day bass is I
15:50:02 ask them what's the difference between a medication and a
15:50:05 poison and that difference between a medication and poison
15:50:08 is the dose. And so, anytime we have a medication that,
15:50:13 unfortunately, is taken at very high doses, then we're
15:50:17 crossing that window of therapeutic benefits. Now we're
15:50:20 entering that window of lethality and severe consequences
15:50:25 like we see with this case series showing 55 deaths with
15:50:31 diphenhydramine.
15:50:33 And also, this was the study that pointed out
15:50:34 that -- going back to what Dr. Uribe mentioned that this
15:50:38 was a low end of the lethal range, again, not appropriate.
15:50:44 This fatal case is what they found is it went all the way
15:50:47 down to .3. So every patient is different. That's what
15:50:51 we have to consider. We can't just base our opinions
15:50:54 based on populations. We have to look at the individual
15:50:58 patient themselves.
15:51:00 Q. Dr. De La Cruz, did you know in your review what
15:51:08 temperature it was inside Mr. Southards' cell?
15:51:11 A. Yes. I believe it was approximately 85 to 88
15:51:18 degrees.
15:51:18 Q. Could a Benadryl overdose cause you to sweat even in
15:51:22 an indoor temperature of 85 to 88 orders?
15:51:25 A. Once you cross that lethal threshold and serotonin

15:51:30 syndrome kicks in, then hyperthermia is going to kick in
15:51:34 no matter what the external environment is. This is what
15:51:36 we're talking about a chemical fire that start from the
15:51:38 inside, right?
15:51:39 So I live in Houston, there's always chemical
15:51:41 fires that we hear about, take cover, you know, toxic
15:51:44 fumes in the air. Heat can affect certain machinery.
15:51:51 Heat can degrade these plants. Heat can degrade these oil
15:51:56 refineries. But as soon as that chemical fire starts in
15:51:59 the inside, it is extremely difficult to put out and
15:52:04 that's where the external heat environment doesn't really
15:52:06 matter to that certain extent. Once that fire has been
15:52:10 lit inside, mortality risk is very high.
15:52:14 Q. I want to ask you about another case you reviewed,
15:52:22 Mr. Ryan Fairchild. Do you recall that?
15:52:24 A. Yes, I do.
15:52:25 Q. When Mr. Fairchild was admitted, was he on substance
15:52:28 protocol?
15:52:29 A. When he was admitted to the hospital, yes. There was
15:52:33 notes, notations in the medical records that he had
15:52:37 possible sepsis that was indicative of white blood cells
15:52:41 that were above the normal range that was indicative of
15:52:45 lymphocytes above the normal range as well, and
15:52:48 neutrophiles, all which tell us that the body is
15:52:52 undergoing an infection.

15:52:54 Like I had mentioned before, infection is
15:52:58 independent of external environment. The body is
15:53:01 naturally trying to increase its temperature to fight off
15:53:05 the pathogen. And so, because of that I did note that
15:53:11 once Mr. Fairchild had left the cell, his body temperature
15:53:17 continued to rise. And so, as a result, they also noted
15:53:21 that within the inpatient setting and that's why he was
15:53:24 started on some of the strongest antibiotics that we have
15:53:28 available, Vancomycin and Meropenem.
15:53:31 Q. Are those medications associated with septic
15:53:34 protocol?
15:53:34 A. Correct. You want to cover as many -- this is
15:53:37 basically throwing a broad net. You want the cover as
15:53:39 many microbes as possible to kill whatever is causing that
15:53:43 specific infection.
15:53:44 Q. And then, your review of Dr. Uribe and Dr. Vassallo's
15:53:48 report, did they note that Mr. Fairchild was on sepsis
15:53:51 protocol?
15:53:51 A. No. That crucial information was left out.
15:53:54 Q. Okay.
15:54:04 THE COURT: Ms. Carter, would this be a good time
15:54:06 for us to take our break?
15:54:08 MS. CARTER: Yes. Of course.
15:54:09 THE COURT: Great. We're going to take our
15:54:10 20-minute break. Let's call it 3:55 and take a break

15:54:15 until 4:15.

15:54:29 (Recess.)

16:22:07 THE COURT: Back to it.

16:22:08 MS. CARTER: And, your Honor, before I begin my questions again, I believe I failed to move 55 into evidence earlier. It's already been admitted as Plaintiffs' 333, the attachment --

16:22:20 MR. SINGLEY: Oh, no objection.

16:22:21 THE COURT: So admitted.

16:22:23 MS. CARTER: Just for the record.

16:22:24 Q. (BY MS. CARTER) Dr. De La Cruz, we just discussed inmate Southards and Fairchild, correct?

16:22:33 A. Correct.

16:22:33 Q. Did you also review the records of Armando Gonzales?

16:22:37 A. Yes, I did.

16:22:38 Q. And, Dr. De La Cruz, did you and plaintiffs' expert Dr. Uribe initially believe fentanyl and midazolam to not have been administered at the hospital?

16:22:52 A. Correct. That was reflected in the pathology reports, which was why that was excluded in my report and that was the only document that I had.

16:22:59 Q. Were those the only substances you observed in all of the records you reviewed?

16:23:06 A. For Gonzales, specifically?

16:23:09 Q. Yes.

16:23:09 A. So there were reports from cellmates, his cellmate in
16:23:16 particular, that Ms. Gonzales was snorting Effexor, which
16:23:21 is venlafaxine which is one of our antidepressants. In
16:23:26 addition to that, Ms. Gonzales was also snorting Benadryl,
16:23:30 which is the antihistamine. And so, those were the other
16:23:34 two substances in addition to what was noted as from
16:23:37 fentanyl midazolam.
16:23:40 Q. And, Dr. De La Cruz, do you mind explaining to the
16:23:43 judge what a polysubstance overdose is?
16:23:45 A. Yes. So a polysubstance overdose is basically where
16:23:49 there is multiple substances involved that can further
16:23:54 increase the lethality of the overdose. So here, with
16:23:57 this particular case, we see possible use of venlafaxine,
16:24:05 Benadryl, and also, Ms. Gonzales' fingers were orange at
16:24:10 the time of death which is an indication that K2 Spice was
16:24:13 also administered or used.
16:24:15 Q. And did Ms. Gonzales have a reported history of K2
16:24:22 use?
16:24:22 A. Yes. According to, I believe, in the OIG report,
16:24:26 there were four other inmates interviewed about Ms.
16:24:29 Gonzales. One of them said that she appeared impaired
16:24:35 earlier that day when she overdosed. Another inmate noted
16:24:40 that she was frequently using K2. Another one noted that
16:24:45 she would take whatever she could get her hands on with
16:24:48 regards to substance use. So substance use was a

16:24:53 prevalent diagnosis in the charts that was noted time and
16:24:56 time again.
16:24:59 And going back to why polysubstance abuse is
16:25:03 lethal and dangerous is the fact that we can have the
16:25:06 additive effects like I talked about earlier, but we can
16:25:09 also have synergistic effects as well. And synergy
16:25:13 basically means that drug one plus drug two equals ten
16:25:18 instead of three. So the combined effect is much greater
16:25:22 than each of the independent effects when used alone.
16:25:25 Q. Dr. De La Cruz, do you recall in your report saying
16:25:30 since the patient has multidrug toxicity, undetected
16:25:33 substances with hyperthermic potential cannot excluded?
16:25:38 A. Correct.
16:25:38 Q. Does that include K2?
16:25:39 A. Yes, that includes K2 as well. I think that's one of
16:25:44 the telltale signs of K2 use is orange fingers. That is
16:25:49 reflected throughout all of the autopsy reports that I
16:25:51 noted and that's something that pathologists also indicate
16:25:56 as a potential substance when it comes to overdose.
16:25:59 Q. Would unknown levels of Benadryl also potentially
16:26:06 lead to hyperthermic potential?
16:26:09 A. Yes. Just like the case with Mr. Southards, we saw
16:26:11 with high levels of Benadryl, that on its own can lead to
16:26:17 serotonin syndrome. Venlafaxine is a selective serotonin
16:26:21 norepinephrine reuptake inhibitor so that will also

16:26:25 independently increase serotonin levels so the combination
16:26:28 of both Effexor and Benadryl can significantly increase
16:26:33 serotonin, increase hyperthermia cases as well.
16:26:38 Q. And, Dr. De La Cruz, as we're discussing K2 use, you
16:26:43 also reviewed the medical records of Jason Wilson; isn't
16:26:47 that correct?
16:26:48 A. That's correct.
16:26:49 Q. Did his toxicology report test positive for K2?
16:26:54 A. Yes. It was both K2 and fentanyl as well. Mr.
16:27:05 Wilson also had a lengthy history of substance use
16:27:10 disorders, had been seen many times throughout the mental
16:27:15 health treatment programs, and had also tried to overdose
16:27:19 on acetaminophen. I forget what that timeframe was, but
16:27:25 Mr. Wilson also had a history of hoarding medications.
16:27:31 Q. And, Dr. De La Cruz, do all labs have the same
16:27:35 reportable level requirement?
16:27:37 A. No.
16:27:38 Q. So some are more sensitive than others?
16:27:41 A. Yes, depending on what assay or what test is used,
16:27:44 they could have variations.
16:27:46 Q. And does the fact that a drug like K2 may not reach
16:27:50 lab A's reportable level mean that it is not lethal?
16:27:53 A. That is inherently an error and one that we always
16:27:57 need to consider with toxicology reports. As noted
16:28:00 earlier, K2 Spice is changing every single -- every single

16:28:08 month, every single year, every single day. Who knows how
16:28:11 many new products are out there. Whatever illicit
16:28:14 manufacturer wants to change the chemical structure, they
16:28:17 can.
16:28:17 So it's hard for any reasonable lab to keep up
16:28:23 with all of those assays since they're constantly
16:28:26 changing. Like I had mentioned earlier, yes, there's 200
16:28:30 well-known synthetic cannabinoids out there, but chances
16:28:35 are, labs aren't covering the other 800-plus.
16:28:42 Q. Dr. De La Cruz, another case I want to talk about is
16:28:49 the case of Keith Pursifull. Is there a final autopsy in
16:28:53 this case, Dr. De La Cruz?
16:28:54 A. No, there's no final autopsy for Mr. Pursifull.
16:28:58 Q. Was there a final toxicology report?
16:29:00 A. No. That is pending.
16:29:02 Q. Dr. De La Cruz, despite this, Dr. Vassallo has
16:29:06 testified that she can definitively say this death was due
16:29:10 to heat. Do you agree?
16:29:11 A. No, I do not agree. And that was another thing that
16:29:14 I noted, time and time again, in Dr. Vassallo's reports is
16:29:18 having this absolute with the cases without considering
16:29:24 all the factors. As I toxicologist, hopefully, she would
16:29:28 opine and talk about the toxicology levels, but that
16:29:31 didn't happen. As a toxicologist, hopefully, she would
16:29:34 mention the substance use disorder history, but that

didn't happen.

And so, there was a lot of information either missed because it wasn't carefully read over or left out, but I'm not too sure. But that is all important information to put the puzzle pieces together to make an overall conclusion. If you're just looking at a dead body and you're just looking at the environmental temperature and drawing a straight line and missing all of these other factors, then you don't have all of those puzzle pieces to make it complete. You're just using one puzzle piece and saying I finish, but that's not how it works.

Q. Dr. De La Cruz, would you be able to make any determination on the lethality associated with Mr. Pursifull without a final toxicology report?

A. No. That would be premature.

Q. The last case I want to talk to you about is Wayne Straway. Did you review those records?

A. Yes, I did.

Q. And did Mr. Straway have any lethal levels of any substance in his toxicology screening?

A. Yes. There were three lethal levels in particular. There were two synthetic cannabinoids. One is the 5F-ADB and then, there was an additional new synthetic cannabinoids that we hadn't seen. In addition to that, there was methamphetamine in his system in the toxicology

16:31:08 reports that were well above the lethal limits.
16:31:11 Q. And was that concentration of the methamphetamine
16:31:15 6.9, I believe you said, is it micrograms per liter?
16:31:20 A. I believe it was 6.9 or 6.3 milligrams per liter.
16:31:26 Q. Milligrams. Thank you. Is that significant in any
16:31:32 way?
16:31:32 A. Is what significant?
16:31:35 Q. Is that concentration of methamphetamine significant?
16:31:38 A. Oh, definitely. So the lethal threshold for
16:31:41 methamphetamine is .3 milligrams per liter and it was 6.3.
16:31:48 So substantially higher than the lethal threshold. There
16:31:51 is no argument there that it was well past the lethal
16:31:55 limits.
16:31:55 Q. And you noted that one of them said that cannabinoids
16:31:58 was 5F-ADB. Was the other one MDMB-4en-PINACA?
16:32:05 A. Correct.
16:32:06 Q. And is the presence of both of these here
16:32:09 significant?
16:32:09 A. Yes. So as we talked about, 5F-ADB on its own is
16:32:13 lethal, but now we're adding on a new synthetic
16:32:18 cannabinoid that can also lead to cardiac arrest, also
16:32:22 lead to respiratory distress, also has the potential to
16:32:25 lead to seizures and sudden death as well. So one by
16:32:28 itself is significant, now we're adding on a second one.
16:32:31 Now we're adding on methamphetamine, yes, definitely.

16:32:38 Q. And, Dr. De La Cruz, you reviewed the plaintiff
16:32:41 experts Dr. Biswas, Dr. Vassallo and Dr. Uribe's reports;
16:32:47 is that correct?
16:32:47 A. That is correct.
16:32:48 Q. And in those reports, some of them made
16:32:51 pharmacological findings; is that correct?
16:32:53 A. Correct.
16:32:54 Q. Did you review the opinion offered by Dr. Biswas?
16:32:56 A. Yes, I did.
16:32:57 Q. And did you review some of the studies she cited to?
16:33:00 A. I did. Yes.
16:33:01 Q. What did those studies have in common?
16:33:03 A. They were all population-based studies. They were --
16:33:09 her whole report was basically a literature review of how
16:33:13 dangerous medications -- mental health medications can be.
16:33:17 The interesting thing about Dr. Biswas' report is that she
16:33:20 didn't opine on any patient cases and so, she was making
16:33:24 these broad-level claims that these psychotropic
16:33:29 medications are inherently dangerous based off all these
16:33:33 population-based studies, but you can't just go off of a
16:33:36 population-based study to make a conclusion, especially if
16:33:38 you don't even look at the patients first to begin with.
16:33:41 Population-based studies can be helpful. We can
16:33:45 look at one in Austin traffic, for example, where a
16:33:48 majority of traffic accidents are due to speeding, right?

16:33:52 And that's a population-based study. Now, someone has an
16:33:55 accident right after we have that study and we say it was
16:33:59 likely due to speeding, let's move on, that's not
16:34:01 appropriate. We're not taking in consideration what was
16:34:05 the blood alcohol concentration. We're not taking in
16:34:07 consideration did they run a stoplight, a stop sign, did
16:34:10 they have a vehicle malfunction, were they texting,
16:34:14 distracted driving there's. So many more individual
16:34:16 factors that need to be considered rather than just
16:34:20 claiming these broad-based opinions overall and
16:34:24 conclusions that she made.
16:34:27 Q. Do you recall reading one of her population studies
16:34:29 regarding suicide rates throughout the year?
16:34:31 A. Yes.
16:34:33 Q. Do you recall that study taking into consideration
16:34:35 whether someone was in air conditioning?
16:34:37 A. Correct.
16:34:38 Q. Did it?
16:34:39 A. Oh, no.
16:34:40 Q. Did it take in consideration someone's core body
16:34:43 temperature?
16:34:44 A. No.
16:34:44 Q. Did it review any autopsy at all?
16:34:46 A. No. And that was reflected throughout multiple
16:34:50 literature citations that she had was, again,

16:34:53 population-based studies can be helpful, but they do not
16:34:58 associate causation. They can tell us trends, but a lot
16:35:01 of those population-based studies that she noted didn't go
16:35:04 into the patient's specifics, what you need to do in order
16:35:07 to complete that puzzle. So no. That was all left out in
16:35:14 a majority of them.
16:35:16 Q. Do you recall Dr. Biswas also opining on SSRIs?
16:35:20 A. Correct.
16:35:20 Q. Do SSRIs have less anticholinergic properties and
16:35:24 antipsychotics?
16:35:25 A. Yes, they do.
16:35:26 Q. Why?
16:35:27 A. They don't bind the acetylcholine muscarinic M3
16:35:32 receptor as tightly as some of our antipsychotics can.
16:35:34 Q. Do antipsychotics actually affect thermoregulation to
16:35:40 the extent Dr. Biswas claims they do in her record?
16:35:43 A. No.
16:35:44 Q. Why?
16:35:45 A. I can cite the pharmacovigilance study of individuals
16:35:49 throughout the 77 countries and 3.5 million cases where we
16:35:55 saw 524 hyperthermic cases, 480 hypothermic. We also have
16:36:01 to take a step back and see, look at the prescriptions in
16:36:06 America. If we were to audit all of the prescriptions and
16:36:10 this information is available via IQVIA, which they do
16:36:14 normal audits to see how many prescriptions individuals

16:36:17 are getting prescribed for certain classes.

16:36:20 So throughout the U.S., there are roughly 80 million individuals that are taking a psychotropic medication. Throughout the U.S., there are roughly 250 million individuals who are receiving an antidepressant medication. Why? Because a lot of people are placed on multiple antidepressants. That's why there's 250 million. How many individuals are taking antipsychotics? Eighty million individuals across the United States are taking antipsychotic medications.

16:36:49 How many heat deaths on average, according to the CDC, are present in the United States, 700. So that is where I say there is a theoretical risk, a paper risk versus a clinical risk. There's a huge difference between knowing the two. And if you look at the headlines that Dr. Biswas noted in her reports, yeah, on paper, mechanistically, these medications can affect thermoregulation, but are we seeing this in a clinical setting? Are we seeing this in our everyday population? If so, that 700 would be way higher and that 700 that they're factoring is just heat-related deaths in general. It's not even looking at medication related, heat-related death so that number is even smaller than that.

16:37:36 So that's why it's important to keep in mind real-world statistics, real-world data versus just what

16:37:43 the headline attention grabbers are.
16:37:49 Q. Dr. De La Cruz, I think I remember this from when you
16:37:52 first brought up the pharmacovigilance study that showed
16:37:58 that less than .01 percent of cases of hyperthermia were
16:38:05 associated with antipsychotics, correct?
16:38:06 A. Correct.
16:38:07 Q. Did you review an antipsychotic, for example,
16:38:18 Risperidone?
16:38:19 A. Yes. That is a well-known atypical antipsychotic.
16:38:24 Q. What about aripiprazole?
16:38:26 A. Yes. It's another atypical antipsychotic.
16:38:29 Q. As a pharmacologist, what levels are those considered
16:38:33 to be in terms of thermoregulation?
16:38:36 A. It would be low, low to moderate at the very highest
16:38:40 but usually the moderate. And the reason that it's
16:38:43 categorized as moderate is when individuals are taking
16:38:45 excessive doses. At normal doses, these medications are
16:38:48 not disrupting thermoregulation.
16:38:51 Q. And risperidone and aripiprazole, those are the
16:38:55 medications that the patients we reviewed today were on;
16:38:58 is that correct?
16:38:59 A. Correct. Those are atypical antipsychotics that can
16:39:03 -- have the potential to lead to these adverse effects.
16:39:05 Q. What about haloperidol?
16:39:09 A. Yes. So this medication also would be low to

16:39:12 moderate risk. A little bit more of a risk just because
16:39:15 it's what we call a typical or first generation
16:39:18 antipsychotic; because of that, it can bind the M3
16:39:22 acetylcholine receptors a little bit tightly and it can
16:39:25 affect thermoregulation at much higher doses, but even
16:39:29 then, it is a lot less compared to other, what they
16:39:33 categorize as anticholinergic medications.
16:39:37 Q. Dr. Biswas also noted in her report that incarcerated
16:39:51 individuals may have impaired insight or cognitive
16:39:54 limitations that would interfere with seeking assistance.
16:39:58 Do you recall that?
16:39:58 A. Yes, I did note that several times in the report when
16:40:02 she cited literature that individuals with mental health
16:40:06 disorders are at a much higher risk. A lot of those
16:40:13 studies were looking with individuals with cognitive
16:40:15 impairment. And in addition to that, the patients that we
16:40:17 talked about today and the patients that I reviewed in the
16:40:19 autopsy reports, none of them had mild, moderate or even
16:40:23 severe cognitive impairments where it would limit their
16:40:26 ability to make decisions or limit their ability to tell
16:40:30 someone that they were in a specific stressor or facing
16:40:36 some known adverse effect.
16:40:38 So that was more of an assumption based on
16:40:42 individuals with mental health disorders. It's basically
16:40:45 saying 70 to 80 million U.S. citizens that are taking

these psychotropics that they have cognitive-related issues. That's not right. That's not how we categorize people. So again, we can't associate those broad-based claims to individual patients without looking at each individual case.

Q. Dr. De La Cruz, Dr. Biswas also cites to the New Orleans heat wave study. Are you familiar with that?

A. Yes.

Q. And that resulted in a 25 percent mortality rate. Did you recall that?

A. Yeah, again, an attention grabber, that's one of the things that we have to keep in mind. If you look at the abstract that Dr. Biswas -- of that study that she noted, it shows that individuals on psychotropic medications had a 25 percent mortality rate.

Now, if you actually open the study up and read the study, it goes much deeper. And so, out of the eight patients that that study included -- it wasn't a large study. It's what we would call a very small study of eight patients, six of those individuals were on psychotropic medications. Four out of the six individuals had overdosed on cocaine and that's why they were hyperthermic. Now, what Dr. Biswas did is took that information and said, oh, they were also on psychotropic medications. This is why there's a 25 percent mortality

16:42:08 rate.

16:42:10 So if carefully read with regards to this study,
16:42:15 it would further support the fact that illicit drugs have
16:42:19 high increased rates of mortality and can lead to death on
16:42:24 their own. And so, that was one of the things that I had
16:42:27 noted about that specific study. So four out of the six
16:42:32 were on cocaine -- overdosed on cocaine. The first one
16:42:35 was an unknown substance. Now, this was 1998 where
16:42:39 chemical assays weren't really that good, so likely, there
16:42:42 were other illicit substances involved.
16:42:44 Q. Dr. De La Cruz, you've mentioned that you have
16:42:51 reviewed the opinion of Dr. Vassallo; is that correct?
16:42:54 A. That is correct.
16:42:55 Q. And you've already commented on Dr. Vassallo's
16:42:59 statement that she's treated thousands of diphenhydramine
16:43:02 overdoses and none of them were sweating, right?
16:43:05 A. That is correct.
16:43:10 Q. You testified that Dr. Vassallo left out in her
16:43:18 opinion multiple instances of illicit drug use and I think
16:43:23 you described substance abuse disorder?
16:43:26 A. Correct, which is all relevant history to keep in
16:43:28 mind for a patient with an overdose.
16:43:31 Q. And are you familiar with treating substance abuse
16:43:34 disorder?
16:43:34 A. Yes, I treat substance abuse disorder in my clinic as

16:43:38 well.
16:43:38 Q. Dr. De La Cruz, were you asked to determine whether
16:43:46 air conditioning would have prevented these deaths?
16:43:48 A. No, I was not asked that.
16:43:50 Q. Could you have determined that?
16:43:51 A. No. I'm a pharmacist, not a heat expert.
16:43:56 Q. Can you say whether these conditions and substances
16:43:59 have high mortality rates independent of environmental
16:44:02 temperature?
16:44:03 A. Yes, I can say that and it is information that a
16:44:05 pharmacist must know. The lethal ranges of medications,
16:44:10 the chances of mortality with medications and illicit
16:44:14 substances as well. Remember pharmacists are the
16:44:16 gatekeepers. We are the very last line of defense before
16:44:20 a patient gets their medication. So these are all factors
16:44:23 that we have to consider to ensure that there's no drug
16:44:26 interactions, to ensure that the patient is taking an
16:44:29 efficacious medication and that it's safe for them and
16:44:32 that it's not going to cause more harm than intended.
16:44:35 Q. Dr. De La Cruz, you've seen plaintiffs' supplemental
16:44:38 opinions of their experts, Dr. Vassallo and Dr. Uribe,
16:44:42 correct?
16:44:43 A. Correct.
16:44:43 Q. Did you see where plaintiffs' experts recant their
16:44:46 opinion that Mr. Samuel Rucker died as a result of heat?

16:44:50 A. Yes, I did.
16:44:51 Q. Is that significant to you?
16:44:52 A. It is because in their original reports, it was noted
16:44:56 that they were very adamant that this was a heat-related
16:44:59 death and that was not factoring all of the information.
16:45:06 So that just shows that they were making opinions without
16:45:10 all of those puzzle pieces and saying that they had a full
16:45:14 diagnosis and going against pathologist findings, as well,
16:45:17 without that information.
16:45:20 Q. Dr. De La Cruz, based on some of the conditions
16:45:28 you've talked about today, including lethal combinations
16:45:32 of regulated drugs, are overdoses on those known to occur
16:45:37 in air-conditioned environments?
16:45:39 A. Yes. Without a doubt, these are chemical fires that
16:45:42 start from the inside. It doesn't matter if you are in a
16:45:45 crisp 68-degree room, if you're on fentanyl, or if you
16:45:50 have K2 in your system, or if you have a combination of
16:45:53 all of the above, then mortality is very high.
16:45:57 Q. What about synthetic cannabinoids, are they fatal on
16:46:01 their own?
16:46:01 A. Yes, they are.
16:46:03 Q. Is fentanyl fatal on its own without being used in
16:46:07 combination?
16:46:08 A. Yes. It's responsible for 80 percent of the
16:46:10 hundred-thousand deaths that occur every year.

16:46:13 Q. Dr. De La Cruz, I just want to ask again, is it your
16:46:16 opinion that heat is harmless?
16:46:18 A. No. Heat is harmful.
16:46:22 Q. Did you ignore environmental heat in your analysis?
16:46:25 A. No. Those were all factors that were taken into
16:46:28 consideration.
16:46:32 Q. Are you here to advocate for prison policy?
16:46:34 A. No.
16:46:36 Q. Do your opinions depend on who hired you?
16:46:38 A. No.
16:46:39 Q. Based on your review, did you identify substances or
16:46:47 conditions in these cases that are known to be
16:46:50 independently capable of causing death?
16:46:52 A. Yes.
16:46:53 Q. And are those conclusions based on your expertise in
16:46:56 pharmacology and the medical literature?
16:46:58 A. Correct. All of the above.
16:47:00 Q. I pass the witness, your Honor.
16:47:04 CROSS-EXAMINATION
16:47:05 BY MR. SINGLEY:
16:47:05 Q. Good afternoon, Dr. De La Cruz. My name's Mike
16:47:12 Singley. I'm one of the lawyers for the plaintiffs. You
16:47:15 and I are meeting for the first time, right?
16:47:17 A. Yes. That's correct.
16:47:18 Q. Well, I have a number of questions for you as you

might imagine. And first of all, I think very candidly on direct examination, you said, listen, about the scope of your opinions, I'm not a medical doctor, one thing I can't do is provide diagnoses, right?

A. Correct.

Q. You can't opine on cause of death or whether any of these issues are contributing to the death, right?

A. Correct.

Q. Okay. So you're not here to say for any one of these cases you've reviewed, that drug or this substance caused or contributed to the death in reasonable medical certainty. You're not offering that opinion.

A. I'm not offering cause, but I am offering more information than what was provided for the opposing experts.

Q. Right. For right now, I'm just asking you about cause of death. And you are not here to opine in any way on what did or did not cause the death, whether drugs or heat or anything else, right?

A. Exactly.

Q. And you're also not here to say that heat did not cause or contribute to any of these deaths. You can't opine on that one way or the other?

A. Correct.

Q. And I think I just heard you say, I'm not a heat

16:48:22 expert?
16:48:23 A. Correct.
16:48:24 Q. You, in fact, have never treated a heat stroke
16:48:30 patient in your clinical practice.
16:48:31 A. Correct. My specialty is in psychiatric pharmacy and
16:48:34 not urgent care.
16:48:37 Q. So it's sort of a different bailiwick.
16:48:40 A. Sure.
16:48:41 Q. Gotcha. When you -- in your bailiwick where you do
16:48:48 treat patients, is it under the guidance of another type
16:48:50 of medical provider? People come to you with a diagnosis
16:48:52 and there's another physician or provider involved? How
16:48:56 does that work?
16:48:56 A. Yes. That's a good question. So at the VA hospital,
16:48:58 I have my own scope of practice. The VA institution
16:49:03 allows pharmacists to work at the top level of our license
16:49:06 as advance level practitioners, so we can start
16:49:10 medications, stop medications, order labs, anything that
16:49:15 deals with the medication aspects itself, that is all our
16:49:21 responsibility and our role. How I work with other
16:49:24 providers is within the interdisciplinary team. So
16:49:27 majority of my patients are sent from primary care
16:49:30 providers where the primary care provider has a patient
16:49:34 with a mental health-related concern. And unfortunately,
16:49:38 mental health is kind of -- does to the back end of

16:49:41 treatment. Individuals may have 15 minutes to see their
16:49:45 PCPs and so, of course, they're going to manage diabetes,
16:49:49 high blood pressure, hyperlipidemia. But oftentimes PCPs
16:49:53 may not want to address mental health disorder because
16:49:56 there's just not enough time, or they want more
16:49:59 specialized focus on these disorders and so, that's where
16:50:02 they will come to me.
16:50:03 What you're referring to in terms of prescribing
16:50:06 under the guidance of another prescriber, that is what we
16:50:09 call collaborative practice agreement, but that is not
16:50:12 something that I have. I work under my own license at the
16:50:14 VA.
16:50:14 Q. But after they've seen an M.D. and then they get
16:50:17 referred to you?
16:50:18 A. Exactly. They have to have a diagnosis to see me.
16:50:20 Q. And so, what I understand your role here to be is
16:50:26 identifying factors, particularly with regards to
16:50:29 medications in general in some of these patient cases that
16:50:33 you think ought to be considered and thought about; is
16:50:37 that right?
16:50:37 A. That's correct.
16:50:37 Q. And also, you are identifying some drugs that you've
16:50:43 talked about, both legal and illegal drugs that
16:50:46 independent of heat can cause death, right?
16:50:49 A. Yes.

16:50:49 Q. And just a general fact that that could happen in
16:50:52 general.
16:50:52 A. That's correct.
16:50:53 Q. Not that that was the cause in any particular
16:50:55 patient.
16:50:55 A. Correct. I want to make sure that all of the factors
16:50:58 are considered when it comes to the deaths.
16:51:01 Q. Obviously, even though some of these drugs can cause
16:51:04 death independently, some also might work together with
16:51:08 environmental heat as co-causes of a death. That can also
16:51:11 happen, right?
16:51:11 A. That has a potential to happen.
16:51:14 Q. Did you read any of the deposition testimony in this
16:51:22 case?
16:51:22 A. No. In terms of other experts' depositions?
16:51:26 Q. Any deposition at all.
16:51:27 A. Besides my own, no.
16:51:29 Q. Okay. So when you're referring to -- when you've
16:51:34 seen the opinion of other experts such as Dr. Vassallo,
16:51:36 Dr. Biswas, you read their reports?
16:51:38 A. Correct.
16:51:38 Q. You're aware that they were deposed in this case,
16:51:41 right?
16:51:42 A. Yes, I am aware.
16:51:43 Q. But you haven't read the depositions.

16:51:45 A. No.
16:51:46 Q. Did you ask to read them?
16:51:47 A. No.
16:51:47 Q. They also testified at trial, both Dr. Biswas and Dr.
16:51:51 Vassallo. Did you know that?
16:51:53 A. I did know that.
16:51:54 Q. You weren't in the courtroom for their testimony.
16:51:56 A. I was not in the courtroom.
16:51:57 Q. So you don't know whether testimony was either by
16:51:59 deposition or at trial, right?
16:52:01 A. I do not know.
16:52:02 Q. Okay. So when you've made comments about -- and
16:52:04 also, Dr. Uribe, same for Dr. Uribe, didn't read his depo.
16:52:08 A. No, I did not.
16:52:09 Q. Not in the courtroom for his testimony.
16:52:10 A. No.
16:52:11 Q. So just what I want to make clear is when you talk
16:52:13 about your understanding of their opinions, you're going
16:52:16 solely based on their reports.
16:52:17 A. That's correct.
16:52:17 Q. Okay. You have no knowledge of what all they may
16:52:19 have testified about that they considered either in their
16:52:21 deposition or at trial.
16:52:22 A. I'm not sure if they changed their mind, but it was
16:52:24 very clear in the report what their stayed conclusion was.

16:52:28 Q. You have no idea to what extent they went into more
16:52:31 detail beyond the report, do you?
16:52:32 A. I'm not sure.
16:52:33 Q. You don't know.
16:52:34 A. I'm not sure.
16:52:34 Q. You're not sure because you didn't read it and you
16:52:38 don't know?
16:52:38 A. I wasn't given that information so yes. I do not
16:52:41 know.
16:52:41 Q. And nor did you ask for it.
16:52:42 A. No.
16:52:43 Q. Were you aware that there was a preliminary
16:52:48 injunction hearing in this case in August of 2024?
16:52:53 A. I was told about that. Yes.
16:52:55 Q. Are you aware that the Court wrote an opinion with a
16:52:59 number of findings after that hearing?
16:53:04 A. I believe so. I've never read that report or I don't
16:53:08 know what the conclusions were with that report.
16:53:10 Q. And you anticipated my next question. You've maybe
16:53:13 heard that happened, but you have not read the report, you
16:53:16 don't know what's in it, you don't know what Judge Pitman
16:53:18 said or found.
16:53:19 A. Correct.
16:53:21 Q. You made some comments about Dr. Biswas and the
16:53:36 studies that she reviewed and one of your comments was she

16:53:39 was looking at population studies, right?
16:53:41 A. Yes. That was majority of the studies that she
16:53:43 reviewed.
16:53:43 Q. Dr. Biswas wasn't offering opinions on individual
16:53:47 cases, was she?
16:53:48 A. Well, if you're going to talk about heat-related
16:53:54 deaths, I think it would be important to know the
16:53:57 individual cases. I mentioned that population-based
16:54:02 studies signify trends and population-based studies don't
16:54:07 go into specifics of individual patients. So all of
16:54:11 those -- a lot of these studies can be headline grabbers,
16:54:13 but you have to look at the specific patients themselves
16:54:16 because each patient is an N of 1 and you have to figure
16:54:22 out what exactly is going on before you make a conclusion.
16:54:26 And so, it was not included in terms of any of the
16:54:29 patient-related information. It was just a whole bunch of
16:54:33 studies that were looking negatively at psychotropic
16:54:39 medications without fully evaluating just how clinically
16:54:42 significant her conclusions were.
16:54:45 Q. Okay. I'm not sure I understand that answer. Let me
16:54:48 try it again. When you read, for example, Dr. Vassallo's
16:54:51 report and Dr. Vassallo -- Dr. Uribe's reports, they
16:54:55 talked about specific patients, Mr. Fairchild, Mr.
16:54:58 Southards, and some of the other ones, read their medical
16:55:01 records, talked about details, had opinions upon cause of

16:55:05 death, right?
16:55:05 A. Correct.
16:55:05 Q. Dr. Biswas didn't do that. She didn't go through
16:55:08 individual patients and purport to make those kinds of
16:55:11 opinions, right?
16:55:12 A. I didn't see any opinions.
16:55:13 Q. Okay. And so, she's talking about populations and
16:55:24 her opinions are on population-level risks. She wasn't
16:55:27 purporting to go down to any of the specific cases and
16:55:29 offer opinions about them, right?
16:55:31 A. That's not -- I mean, I assume that she either didn't
16:55:35 receive that information or wasn't comfortable opining on
16:55:39 that information. I'm not sure. But as a forensic
16:55:42 psychiatrist, I think that information is important to
16:55:46 know each individual case before just turning in a report
16:55:51 that's a narrative review of all of these different
16:55:53 reports that have various findings that support the
16:55:56 overall conclusion.
16:55:58 Q. Okay. So even though Dr. Biswas didn't purport to
16:56:03 offer opinions about the individual cases, you're faulting
16:56:08 her for not doing that. Is that what I'm hearing?
16:56:10 A. No. I'm saying that it would be helpful to not just
16:56:13 include population-based studies but, also, look at the
16:56:16 individual patients because population-based studies don't
16:56:20 really tell us anything but trends.

16:56:22 Q. Well, they tell you about -- I mean, obviously,
16:56:26 epidemiological studies can tell us a lot about the
16:56:28 general effects of various things like drugs and how they
16:56:31 affect different populations, right?
16:56:32 A. Sure.
16:56:33 Q. Those are things you want to look at.
16:56:34 A. Sure. That's not everything, though.
16:56:36 Q. Didn't say it was everything, but that's one
16:56:38 important piece of the puzzle to look at when you're
16:56:40 trying to say in general, what effects do these things
16:56:42 have on populations. You want to look at those, don't
16:56:45 you?
16:56:45 A. Key word "in general."
16:56:46 Q. Right. Exactly. And then, when you're purporting to
16:56:51 give opinions on individual patients like Dr. Vassallo and
16:56:54 Dr. Uribe do, you consider the factors about the patients,
16:56:57 the medical records and the facts and circumstances.
16:57:00 A. Correct.
16:57:01 Q. That's your point here, right?
16:57:02 A. Correct.
16:57:03 Q. Before we talk about some of these individual cases,
16:57:23 I would like, Paul, if you could bring up Defendant's
16:57:26 Exhibit 168. I believe this is one of the papers you were
16:57:31 talking about with Ms. Carter and it had to do with
16:57:40 antipsychotics and hypothermia. This was one of the

16:57:43 things you were looking at?
16:57:44 A. Correct.
16:57:45 Q. Hypothermia is lower temperature?
16:57:51 A. That's correct.
16:57:52 Q. Lower body core temperature?
16:57:54 A. Right.
16:57:55 Q. Hyper is the high, hot body temperature above -- high
16:57:59 level of it, right?
16:58:00 A. Correct.
16:58:00 Q. Okay. Well, what this paper is addressing is
16:58:04 hypothermia, the low one, not the high one, right?
16:58:07 A. That's not correct. It also makes reference to
16:58:11 hyperthermia as well, which they had already studied.
16:58:14 Q. Indeed, it does make reference to it. So first of
16:58:24 all, if we look right under abstract there, it's talking
16:58:27 about hypothermia as an adverse drug reaction of
16:58:31 antipsychotic drug use, right?
16:58:32 A. Correct.
16:58:34 Q. Nothing about this studies the aspect of the
16:58:38 interaction between antipsychotic drugs and environmental
16:58:41 heat, does it?
16:58:43 A. It is specifically to hyperthermia, not environmental
16:58:47 heat.
16:58:49 Q. Did you say hyperthermia?
16:58:51 A. Hyperthermia is noted in this study in 524 patients.

16:58:55 Q. Right. But my question was there's no aspect of this
16:58:58 paper that discusses environmental heat and any potential
16:59:02 interaction with antipsychotic drugs, right?
16:59:05 A. Correct.
16:59:05 Q. And it does refer to hypothermia. See in the
16:59:11 introduction there on the right side, key words
16:59:14 introduction?
16:59:14 A. Yes.
16:59:15 Q. Second paragraph says the hypothermic effects, low
16:59:20 temperature, of antipsychotic drugs seems less well-known
16:59:23 than the hyperthermic effects, for example, malignant
16:59:28 neuroleptic syndrome. Did I read that correctly?
16:59:31 A. Correct.
16:59:31 Q. So what they're saying there pretty clearly is the
16:59:36 hyperthermic effects of those drugs are well-known.
16:59:39 A. It has been shown in certain cases, specifically,
16:59:41 overdoses or neuroleptic malignant syndrome. That is
16:59:44 correct.
16:59:44 Q. And also, antipsychotic drugs can make you more
16:59:47 sensitive to the effects of environmental heat, right?
16:59:51 A. They have potential to affect thermoregulation,
16:59:54 depending on the dose.
16:59:56 Q. Right. And there's different effects of the
16:59:59 different drugs, but in general, the antipsychotics as a
17:00:01 class are regarded as drugs that make you sensitive to

17:00:04 environmental heat, right?
17:00:05 A. They have the potential. It's not a guarantee. I
17:00:07 think that's important thing to keep in mind that
17:00:10 mechanism does not equal inevitability.
17:00:12 Q. Understood. They work in different ways, right?
17:00:14 A. Correct.
17:00:14 Q. And not every -- if we look at any one particular
17:00:17 person, they may or may not have a heat-sensitizing effect
17:00:22 from an antipsychotic in any case, right?
17:00:24 A. Yes.
17:00:24 Q. But in general, when you start doing those
17:00:26 population-level studies and more broad studies, it's been
17:00:29 repeatedly shown that antipsychotic drugs make you heat
17:00:31 sensitive.
17:00:32 A. Potentially.
17:00:33 Q. Doctor, let's talk about some of these individual
17:00:45 cases if we can. So first of all, you talked about Mr.
17:00:53 Southards, correct?
17:00:54 A. Yes. That's correct.
17:00:56 Q. And one of the things you were talking about in the
17:01:00 context of Mr. Southards' case was the presence of
17:01:04 diphenhydramine or Benadryl that was found on tox report
17:01:08 of his autopsy, right?
17:01:09 A. That is correct.
17:01:10 Q. Again, you're not saying that Benadryl or any other

drug caused or contributed to his death. You're not here to talk about that.
A. I'm here to say that it was above the lethal limits. In addition to Benadryl, let's not forget that carbamazepine and sertraline was found also in the toxicology reports, neither of which was prescribed to Mr. Southards.
Q. So you noted that there was high environmental heat index that day was around over 96 degrees?
A. I don't remember the specific heat index if that's what you're asking.
Q. You don't dispute that, do you?
A. No. If you have it in front of you, I trust you.
Q. Now, you talked a little bit about Benadryl and you also talked about this issue of sweating. Diaphoresis, I believe. He was found with diaphoresis. He was also found with his skin hot to the touch, right?
A. Correct.
Q. That's certainly something that could be indicative of hyperthermia?
A. Potentially, in addition to serotonin syndrome. But one important thing, before we move on, about the diaphoresis. So Dr. Vassallo had made it very clear that you cannot sweat with the Benadryl overdose, which we've already talked about is not true, but if we look at the

17:02:37 pharmacological mechanisms of carbamazepine and sertraline
17:02:41 and you look at the adverse effects, sweating and
17:02:44 diaphoresis one of them. So when you're taking both of
17:02:48 these other substances higher in concentration than
17:02:50 normal, then that can also, too, explain. So there's
17:02:53 three different factors in terms of why diaphoresis might
17:02:57 be present.
17:02:58 Q. There probably would have been a time when it would
17:03:00 have been helpful for you to have read Dr. Vassallo's
17:03:02 deposition or trial testimony. Her opinion is actually
17:03:05 that she has never seen a patient with a lethal overdose
17:03:08 of Benadryl sweating. You haven't seen one of those
17:03:12 either, have you?
17:03:13 A. I have not.
17:03:14 Q. And that's an important difference that the opinion
17:03:18 is you've never seen someone with a lethal overdose of
17:03:22 Benadryl sweating versus any high level of Benadryl
17:03:26 sweating. Those are two very different potential things,
17:03:30 aren't they?
17:03:30 A. It can be. And it's also important to note that I
17:03:33 don't just limit my conclusion to what I see in my open
17:03:35 practice. Again, availability bias. That's why I turn to
17:03:39 case reports. That's why I turn to studies to figure out
17:03:43 what else is going on, specifically, with that individual
17:03:45 patient. But having a conclusion just based off of what

17:03:49 you see is not appropriate.
17:03:50 Q. You don't see the patients like this with heat stroke
17:03:55 or these -- you're not there when they're bringing them
17:03:57 into the emergency room caring for them. You're not
17:03:57 that --
17:03:59 A. That's correct. I'm not.
17:03:59 Q. And I take it you're not going to discount the
17:04:02 knowledge, experience and value that comes from having
17:04:05 decades of experience treating patients like that. You're
17:04:08 not here to discount that --
17:04:09 A. I'm not here to discount it, but I'm also here to
17:04:12 state that other things happen outside of the narrow world
17:04:16 view that you experience on your own.
17:04:17 Q. Sure. And you want to look at literature, among
17:04:19 other things?
17:04:19 A. Exactly.
17:04:20 Q. Perhaps even including population studies to see what
17:04:22 effects drugs have in general.
17:04:23 A. That could help amongst other studies as well.
17:04:26 Q. You referred to in talking about this diaphoresis
17:04:32 issue, you referred to -- I think there was a -- I think,
17:04:39 a letter, a one-pager, by an author named Tanaka,
17:04:44 Defendant's Exhibit 170. Would you put that up, Paul?
17:04:51 So I believe this was the literature you referred
17:04:56 to to support a case report that you knew about where

there was a Benadryl overdose where there was diaphoresis?
A. This is one of several that I reported in my report. Yes.
Q. This is the only one that was lethal. Was this lethal?
A. I believe this -- let me double check before I answer. I can't see the bottom section. Please scroll down. Doesn't look like this was lethal, but it was stated that this was a suicide attempt that was present with the Benadryl which, again, further supports other studies that this is a widely used medication for suicide.
Q. But the answer to my question was not lethal?
A. For this individual case, no.
Q. Okay.
A. This individual case was not talking about lethality. And in my report, I wasn't talking about diphenhydramine-based lethality. That's another case I did cite to. There was specifically talking more about Vassallo's claims that you cannot sweat with a diphenhydramine overdose.
Q. Okay. But now, you've had to clarify that her opinion is that you can't sweat with a lethal overdose. That's a different matter, isn't it?
A. Can you repeat the question?
Q. Whether you can sweat with a lethal overdose of

17:06:46 Benadryl is a different question from whether you can
17:06:49 sweat with, say, mildly high level of Benadryl. Two very
17:06:54 different questions, right?
17:06:55 A. Potentially.
17:06:57 Q. Now, Mr. Southards' level of -- and I'm sorry, you
17:07:02 didn't cite to an example, a case report where there was a
17:07:07 lethal diphenhydramine level and there was diaphoresis,
17:07:13 did you?
17:07:13 A. I don't believe I included one.
17:07:16 Q. And on this particular nonlethal one, let's take a
17:07:21 look at the level. So, Doctor, do you see her plasma
17:07:33 concentration of diphenhydramine -- and you're going to
17:07:35 need to help me with the levels. I know there's one
17:07:38 that's bigger in the thousands and one that's the 2.24. I
17:07:42 think you referred to Mr. Southards' level as 6.3.
17:07:42 A. Correct.
17:07:50 Q. And how does it compare to that?
17:07:51 A. Mr. Southards had 6.3 micrograms. This is
17:07:54 milligrams.
17:07:54 Q. Okay. And what would the comparison be there?
17:07:57 A. It's a thousand more -- or thousand less for the
17:08:02 micrograms.
17:08:02 Q. Okay. So it's a thousand less than Mr. Southards'
17:08:04 level?
17:08:04 A. Correct.

17:08:04 Q. Thank you, Paul. You also looked at a paper by
17:08:15 Pragst to discuss the -- I'm moving beyond the diaphoresis
17:08:21 issue to the question of the lethal load. Do you remember
17:08:23 discussing that with Ms. Carter?
17:08:25 A. Yes. That was the study that looked at serotonin
17:08:28 syndrome and the temperatures associated with patients
17:08:31 that had lethal mortality rates with serotonergic
17:08:40 medications.
17:08:40 Q. Let's see if we're talking about the same thing.
17:08:43 Would you bring up Defendant's Exhibit 175?
17:08:49 A. There was a lot of studies in my report.
17:08:52 Q. Now, you cited this paper, I think, for the
17:09:01 proposition that 5,000 of the units, that's nanograms per
17:09:01 milliliter?
17:09:11 A. This is micrograms. Nanograms is a thousand even
17:09:13 smaller than micrograms.
17:09:15 Q. Okay. So this paper is expressing it in terms of
17:09:24 what?
17:09:24 A. Micrograms per milliliter.
17:09:27 Q. And Mr. Southards' level was?
17:09:28 A. Micrograms -- 6.3 micrograms per milliliter.
17:09:31 Q. And how does that relate to the levels being used in
17:09:34 this paper?
17:09:34 A. This study was noting that a concentration above 5
17:09:38 micrograms per milliliter is the lethal dose -- or I'm

17:09:42 sorry, the lethal concentration of diphenhydramine. So
17:09:45 Mr. Southards was about 26 percent greater than that
17:09:49 lethal dose.
17:09:50 Q. 6,300 versus 5,000.
17:09:52 A. Correct.
17:09:53 Q. Okay. Let's take a look -- now they looked at two
17:09:56 types of patients. There were deaths and there were
17:09:59 non-deaths. There's 55 death cases, right?
17:10:01 A. That is correct.
17:10:01 Q. Then there's 68 cases where people had high levels of
17:10:06 Benadryl but didn't die, right?
17:10:08 A. That is correct.
17:10:08 Q. In this figure, there's two -- they talk about the
17:10:29 levels of the patient so there's one for the 68 non-death
17:10:33 cases and then, one later for the 55 death cases, right?
17:10:35 A. Correct.
17:10:36 Q. So these are people who lived, right?
17:10:38 A. There's a mixture of individuals who lived and also
17:10:41 died.
17:10:42 Q. On this very figure 3.
17:10:44 A. I would have to see if you can scroll down. I can't
17:10:47 see --
17:10:48 Q. You see on figure 6 where it's talking about the
17:11:02 concentrations in the 55 deaths, right?
17:11:07 A. Correct. This is the one that is looking

17:11:09 specifically at the deaths.
17:11:10 Q. And at the top of the paper, it said they were
17:11:12 considering 55 death cases and 68 living cases, right?
17:11:16 A. Correct.
17:11:16 Q. Here, we've got the death figure with 55, right,
17:11:23 death cases?
17:11:23 A. Correct. If you can actually scroll up to the very
17:11:29 top, I want to make sure I didn't misspeak.
17:11:37 Q. You see up top in that first sentence, 68 nonfatal
17:11:41 and 55 fatal poisonings.
17:11:44 A. I just want to make sure I got the --
17:11:46 Q. So we have two figures. One deals with people that
17:11:50 lived, one with the death cases. If you'd go back to
17:11:53 figure 3, Paul, the people who lived. So this is showing
17:12:04 on the Y axis, we've got the DPH is diphenhydramine,
17:12:11 right?
17:12:11 A. You're correct.
17:12:12 Q. We've got that concentration in their blood at the
17:12:14 micrograms per milliliter, right?
17:12:16 A. That's correct.
17:12:17 Q. And you see how the Y axis goes from zero to 10?
17:12:20 A. Yes.
17:12:20 Q. And it's kind of doing the concentration -- blood
17:12:23 concentrations of the people who lived in ascending
17:12:25 concentration level?

17:12:26 A. Correct.
17:12:26 Q. And at the very far right, we see two patients who
17:12:32 lived that had levels that appear to be around 8 -- would
17:12:39 this be 8 or 8,000? How do you express it?
17:12:41 A. Eight micrograms per milliliter.
17:12:43 Q. Right. So that's way higher than Mr. Southards'
17:12:46 level, those two patients on the right, right?
17:12:48 A. Those individuals won the lottery. That's not
17:12:51 common.
17:12:51 Q. But we do see in this paper that you're relying on
17:12:54 two patients with much higher levels than Mr. Southards
17:12:57 and they lived, right?
17:12:57 A. Depending on how quickly they received intervention,
17:12:59 yeah, that could make a difference, but we have to look at
17:13:03 these specific factors to see what is the reason that they
17:13:06 did live.
17:13:07 Q. Well, what we know from this paper and my only
17:13:09 question for you is this paper you're relying on, that
17:13:11 figure shows two people who had those much higher
17:13:15 concentrations than Mr. Southards and they lived, right?
17:13:17 A. Correct. There was also 53 that had much lower and
17:13:21 died as well.
17:13:22 Q. Sure. Would you bring up the autopsy for Mr.
17:13:26 Southards, Paul? It is 192C and if you would go to page
17:13:39 10 of the PDF, please. So you saw this tox report as part

17:13:46 of your review of the case, right?
17:13:47 A. That is correct.
17:13:48 Q. And I want to look at -- did you see what the comment
17:13:52 here was on the autopsy tox report about the lethal levels
17:13:58 of diphenhydramine? Did you review that?
17:14:00 A. I did, yes.
17:14:01 Q. If you'd scroll down, do you see, Paul,
17:14:04 diphenhydramine at the bottom, blow that up. Okay. So
17:14:13 these are the comments -- after the levels are reported,
17:14:15 there are comments about the drugs. This is pretty
17:14:19 typical in a tox report.
17:14:20 A. That is true.
17:14:21 Q. So towards the bottom, do you see where it starts the
17:14:25 average blood diphenhydramine concentrations? Do you see
17:14:28 where I am?
17:14:28 A. I see that.
17:14:29 Q. The average blood diphenhydramine concentrations
17:14:33 reported in fatal overdoses were 1,400 nanograms per
17:14:38 milliliter in infants, 4,400 nanograms per milliliter in
17:14:42 children, and 15,000 nanograms per milliliter in adults.
17:14:48 Did I read that correctly?
17:14:49 A. That's correct.
17:14:50 Q. All right. So this laboratory and this tox report on
17:14:54 Mr. Southards' autopsy reports that not five but 15,000
17:15:00 nanograms per milliliter is the lethal dose. That's what

17:15:04 this says, doesn't it?
17:15:05 A. We need to make the conversion. So 15,000 nanograms
17:15:08 is 15 micrograms and we also have to keep in mind what
17:15:12 that sentence is actually saying and it's saying that the
17:15:15 average blood diphenhydramine concentration -- it's not
17:15:18 saying the lethal limits of diphenhydramine concentration.
17:15:21 That means that there were individuals that took way more
17:15:25 diphenhydramine and that's drawing those averages up. But
17:15:29 this in no way is stating that that is the fatal lethal
17:15:32 range of diphenhydramine.
17:15:33 Q. This is -- 15,000's a level way, way higher than Mr.
17:15:36 Southards had, right?
17:15:37 A. That is the average. I wouldn't say way, way higher.
17:15:40 It's higher.
17:15:42 Q. Okay. Mr. Southards' level was 6,300 as compared to
17:15:48 this 15,000?
17:15:49 A. It was 6.3 micrograms. This is saying, yes, it's 15
17:15:52 micro --
17:15:52 Q. This is 15 micrograms.
17:15:54 A. Exactly.
17:15:54 Q. So it's -- this level is almost twice as high. The
17:15:59 reported 15.
17:16:00 A. You're looking at averages.
17:16:02 Q. Actually, it's more than that. 6.3, let's see, 12.6
17:16:10 is doubled. So it's more than twice as much this 15 level

they report, right?
A. That's great. I think that's helpful for us to know. I think that kind of ties back into population-based studies. This is what we see overall. But again, we're factoring an N of 1. We're factoring in that one individual patient and what we see is that was above the lethal limit.
Q. And -- but what's reported on the actual -- this does relate -- finding does relate to fatal overdoses. The average blood diphenhydramine concentrations reported in fatal overdoses was. So they're talking about the findings in fatal overdoses right here, aren't they?
A. Yes. That's correct.
Q. Okay.
A. Meaning that, to further clarify your point, they were fatal overdoses that are individuals had much higher concentrations of diphenhydramine. But I think that kind of goes back to Uribe's mischaracterization of lethal concentrations in that it's not appropriate to say that this was on the lower end. There is no lower end of lethal concentration. Once you cross it, mortality risk increases significantly.
Q. But we've also seen people surviving in that range in much higher than Mr. Southards.
A. Sure. If you want to compare, yes.

17:17:25 Q. Let's turn to Mr. Ryan Fairchild. He's one of the
17:17:57 patients you discussed, correct?
17:17:58 A. Yes, sir.
17:17:59 Q. When you wrote your report, you didn't know Mr.
17:18:05 Fairchild's body temperature, did you?
17:18:06 A. No. I did not have that information at the time.
17:18:08 Q. And his body temperature, axillary temperature was
17:18:14 108, right?
17:18:14 A. I believe that to be true.
17:18:16 Q. Okay. That's a really high body temperature. That's
17:18:21 heat stroke-type body temperature?
17:18:23 A. That could potentially be heat stroke or other
17:18:25 factors.
17:18:26 Q. Well, you're just referring to what potentially
17:18:33 causes it, but that's a really high body temperature?
17:18:35 A. That's a high body temperature. I agree.
17:18:37 Q. Did you view the ambient temperatures for the unit
17:18:42 where Mr. Fairchild was held? Did you see that the
17:18:46 outdoor heat index was around 117 degrees about the time
17:18:50 he was found down? Did you see that?
17:18:52 A. I did see that.
17:18:54 Q. Very high environmental heat, right?
17:18:55 A. That's correct.
17:18:56 Q. And Mr. Fairchild had a number of things that made
17:19:00 him heat sensitive, right?

17:19:03 A. There were a number of comorbidities that -- present
17:19:07 in Mr. Fairchild's report.
17:19:08 Q. Hypertension, Type II diabetes, major depressive
17:19:13 disorder, obesity, chronic venous stasis, you saw all
17:19:16 those things?
17:19:16 A. Yes.
17:19:16 Q. That's a lot of things make you heat sensitive,
17:19:18 right?
17:19:18 A. Correct.
17:19:19 Q. Did he take medications that made him heat sensitive
17:19:22 as well?
17:19:23 A. He was on multiple medications.
17:19:25 Q. That made him heat sensitive?
17:19:27 A. Potentially. We're not going to say, as we've
17:19:30 already talked about, absolutes with medications. There
17:19:32 is a wide range of causes. But no, we cannot say that
17:19:35 these medications absolutely made him heat sensitive.
17:19:41 Q. Paul, if you'd put up Mr. Fairchild's autopsy. It's
17:20:00 358A. So you see his prescribed medications?
17:20:05 A. Correct.
17:20:06 Q. You see that list?
17:20:06 A. Yes.
17:20:07 Q. Tell me which one of those have the potential to
17:20:10 cause heat sensitivity.
17:20:11 A. Potential could be propranolol. This is a beta

17:20:15 blocker. This could lower the blood pressure and lead to
17:20:21 vasodilation-related effects not allowing blood to go to
17:20:24 the periphery. In addition to that, furosemide is a
17:20:31 dieretic. This medication may lead to a little bit more
17:20:33 dehydration. Bupropion has stimulant-related properties
17:20:38 since it binds to norepinephrine receptors so --
17:20:42 potentially but this is an extremely low related risk.
17:20:45 Does not have anticholinergic side effects.
17:20:48 Benztropine is a very common, well-established
17:20:53 medication that when taken at very high doses, if an
17:20:58 individual is starting a medication can also lead to
17:21:01 anticholinergic side effects. Aripiprazole like we
17:21:05 already discussed previously, this is a second generation
17:21:09 antipsychotic. We don't expect any
17:21:13 thermoregulatory-related issues there.
17:21:13 Amlodipine is not going to affect the
17:21:17 acetylcholine receptors, but depending on how low that
17:21:20 blood pressure goes, it could affect sweating as well.
17:21:24 Aspirin, metformin, the one that I skipped over, no major
17:21:28 differences.
17:21:29 Q. Quite a number of medications and comorbidities with
17:21:32 the potential to cause heat sensitivity, right?
17:21:35 A. There is a potential, yes.
17:21:36 Q. And you reviewed Mr. Fairchild -- his medical
17:21:39 records, it sounds like. He was taken to the ER before he

17:21:42 was transferred to another hospital, right?
17:21:45 A. Correct. Yes.
17:21:46 Q. Now, I heard you speaking about considering the
17:21:51 prospect of sepsis with Mr. Fairchild; is that right?
17:21:54 A. It wasn't me considering it. It was written in his
17:21:57 documentation in his medical records.
17:22:01 Q. But again, you're not here saying that, he, in fact,
17:22:07 had sepsis or that if he did, sepsis contributed to his
17:22:11 death, right?
17:22:11 A. I'm saying that sepsis protocol was started based on
17:22:14 elevated white blood cells, lymphocytes.
17:22:17 Q. But let's look if he was actually diagnosed with
17:22:20 sepsis. Paul, if you'd put up his medical records, it is
17:22:25 358B, page 15 of the PDF. We have the disposition
17:22:37 summary?
17:22:37 A. Correct.
17:22:38 Q. All right. So before his disposition to the next
17:22:41 facility so they're kind of summarizing information. This
17:22:43 is a pretty standard medical record thing, right?
17:22:43 A. Yes.
17:22:47 Q. Do you see where it says -- it lists the diagnoses?
17:22:48 A. Correct.
17:22:49 Q. Sepsis is not listed as a diagnosis there, is it?
17:22:52 A. I don't see it listed there.
17:22:53 Q. And you do see hyperthermia.

17:22:55 A. I do see hyperthermia. I also would like to point
17:23:06 out, I don't think I mentioned with Fairchild as well,
17:23:09 those comorbidities that did exist, the heart -- his
17:23:12 weight, 570 grams. The normal heart weight is 300 grams
17:23:16 so his heart was almost twice that.
17:23:19 Q. He had serious cardiomegaly.
17:23:22 A. Serious cardiomegaly. He had renal dysfunction,
17:23:25 kidney issues. He had liver dysfunction as well and
17:23:28 that's what the autopsy reports had deemed as contributing
17:23:32 factors to his death.
17:23:32 Q. Well, I'm glad you mentioned that. Did the autopsy
17:23:35 report mention his body temperature of 108 degrees?
17:23:39 A. I don't believe the autopsy did but the OIG report
17:23:41 did.
17:23:41 Q. But it's nowhere listed in the autopsy, is it?
17:23:45 A. It's not.
17:23:46 Q. And it's probably if -- as you've pointed out, we
17:23:50 need to consider all the information for the physicians
17:23:52 who are coming to cause of death, that's a pretty
17:23:54 important piece of information to have in the picture,
17:23:56 you'd agree.
17:23:57 A. I would agree.
17:23:58 Q. Let's turn to Mr. Pursifull. So we've got for Mr.
17:24:25 Pursifull. He had a very high core body temperature of
17:24:28 105.4, right?

17:24:29 A. I don't remember the exact temperature. I'll take
17:24:33 your word.
17:24:34 Q. Paul, would you bring out Plaintiffs' Exhibit 395?
17:24:46 Page 18, please. Got Mr. Pursifull's medical records.
17:24:57 You reviewed these?
17:24:57 A. I did. Yes.
17:24:58 Q. You see at the bottom, not long after he's pronounced
17:25:01 dead, 15 minutes later, core temp is 105.4, right?
17:25:05 A. That is correct.
17:25:07 Q. Had a high body temperature, right?
17:25:08 A. It is.
17:25:09 Q. Now, Mr. Pursifull has a provisional autopsy that was
17:25:16 just released to us while in trial was going on last week
17:25:22 and the only finding on that -- what did that tox screen
17:25:29 on that provisional autopsy find?
17:25:30 A. I believe they needed more information for the
17:25:33 synthetic cannabinoids test and they were going to send
17:25:36 out labs to confirm that.
17:25:38 Q. And the only thing that they found was synthetic
17:25:41 cannabinoids but noted to be below the reporting level for
17:25:44 the lab. Did you see that part?
17:25:46 A. I did see that. More important aspect to keep in
17:25:49 mind is that a lot of lab assays don't cover all synthetic
17:25:53 cannabinoids so it's not uncommon to see that on assay and
17:25:56 get confirmation.

17:25:58 Q. But the only finding that we have with the
17:26:00 information available now is a finding of synthetic
17:26:04 cannabinoid below the reporting limit, right?
17:26:05 A. One synthetic cannabinoid. Oftentimes, it's not just
17:26:09 one.
17:26:09 Q. But that's the only finding we've got right now,
17:26:11 right?
17:26:11 A. As of right now, yes. And we also have his past
17:26:14 medical history which is also relevant. Mr. Pursifull had
17:26:18 a diagnosis for many years with hallucinogen use disorder
17:26:23 so chronic K2 Spice.
17:26:26 Q. At this point, it's just going to be speculative
17:26:33 about what further test results. We just don't know what
17:26:36 they're going to show.
17:26:37 A. We don't know at this time.
17:26:39 Q. And you're aware, that, again, the temperature of Mr.
17:26:45 Pursifull's unit were very high in the days leading up to
17:26:50 his death. Heat indices into mid-90s and hundreds. Did
17:26:52 you see that?
17:26:52 A. I'd have to go back to the specific records before I
17:26:54 agree, but I don't remember the specific heat index or the
17:26:58 heat temperature.
17:26:58 Q. You don't dispute that, do you?
17:26:59 A. I don't dispute, no.
17:27:03 Q. Did you notice that the autopsy report indicated that

17:27:05 there was no discoloration on his fingertips to indicate
17:27:10 immediate drug use?
17:27:12 A. I don't remember that being mentioned.
17:27:15 Q. Paul, would you bring up the autopsy, please, 581,
17:27:19 Plaintiffs' 581? And page 4. Do you see right above
17:27:35 external examination, it says examination of his
17:27:38 fingertips?
17:27:40 A. Yes, I do see that.
17:27:42 Q. So that's what I just told you. It's there in the
17:27:46 autopsy, right?
17:27:47 A. I see it, yeah, no discoloration, but that also can't
17:27:51 be a ruling-out cause. Oftentimes with K2 Spice, you see
17:27:55 orange fingertips, but just because fingertips weren't
17:27:58 there could have been a different substance entirely.
17:28:00 Q. But that's something that we frequently see this
17:28:03 being looked for on autopsies and you agree, you want to
17:28:06 look for that because that might give you information if
17:28:09 you found it.
17:28:10 A. Correct.
17:28:11 Q. So they look for it and have a negative finding on
17:28:13 that front, right?
17:28:14 A. Yeah, to indicate immediate drug use.
17:28:22 Q. One of my colleagues has just reminded me when they
17:28:25 looked in the cell, they didn't find any drug kind of
17:28:26 contraband there as well.

17:28:27 A. No, I don't believe they did.
17:28:29 Q. Okay. That's later in that saying no contraband was
17:28:33 found in the cell right after that, right?
17:28:34 A. Let me double check. Yeah, that's correct. And
17:28:49 then, also, if we were to go into more detail, he was new
17:28:52 to the prison, had a long history of self-injurious
17:28:55 behaviors, including cutting, banging his head, punching
17:28:58 walls. He'd been in crisis management multiple times
17:29:01 before inpatient admissions, and also had that
17:29:05 hallucinogen use disorder on his record.
17:29:08 Q. There was no hallucinogens found on the tox screen,
17:29:13 right?
17:29:13 A. Not yet or potentially not yet.
17:29:15 Q. It's saying that they'd be found later is purely
17:29:19 speculative at this point.
17:29:19 A. I do not have the final toxicology reports.
17:29:23 Q. Let's talk next about Mr. Straway. So his autopsy --
17:29:38 so first of all, again, he was in unair-conditioned
17:29:42 housing. The indoor temperature at his unit there was
17:29:46 right around 88 degrees Farenheit, the heat indices
17:29:51 outdoor his unit at that time were high 90s to a hundred.
17:29:55 Do you remember that?
17:29:56 A. I don't remember specific heat index for this case.
17:29:58 Q. Do you dispute that?
17:29:59 A. I don't dispute it.

17:30:01 Q. Let me ask you a question. He had a very high body
17:30:06 temperature as well, yes? A rectal core body temperature
17:30:08 of 106. Do you remember that?
17:30:10 A. It was high, yes.
17:30:12 Q. 106?
17:30:14 A. I don't remember the core body temperature but yes, I
17:30:16 take your word. No dispute.
17:30:19 Q. Let me ask you a question about K2. By themselves --
17:30:35 you know, someone's handed me an interesting question.
17:30:37 Let me go back to Mr. Straway. With regard to Mr.
17:30:41 Pursifull, this is an interesting question.
17:30:42 I guess as a Pharm.D, do you deal with tox
17:30:44 reports and getting tox reports? Do you do that?
17:30:46 A. Yes, I do.
17:30:47 Q. Okay. Mr. Pursifull died on August 9th of 2025. You
17:30:53 recall that?
17:30:53 A. If you say so. I don't remember the specific date.
17:30:56 Q. So that's eight months ago almost? Pretty unusual
17:31:01 for a tox report to take eight months, wouldn't you agree
17:31:04 with me?
17:31:05 A. No. You'd be surprised.
17:31:06 Q. That's not typical at all. That's not average in any
17:31:10 way, is it?
17:31:10 A. There's backlogs everywhere.
17:31:12 Q. That's not an average time by any means, is it?

17:31:13 A. I don't know average time but I wouldn't be
17:31:15 surprised.
17:31:16 Q. Let's get back to Mr. Straway.
17:31:19 A. If there's no inhouse toxicology measurement, which
17:31:21 we have at the VA, yeah, I could send them and get the
17:31:24 labs that same day. But if you have to send it out --
17:31:27 Q. Maybe it takes two months.
17:31:29 A. Hopefully but I can't say.
17:31:32 Q. Okay. So K2, let's say you're in air conditioning.
17:31:38 Let's take ambient heat out of it. If you take K2 and
17:31:42 you're in air conditioning, K2 by itself doesn't raise
17:31:46 your body temperature just taking the drug, does it?
17:31:49 A. It has the potential to and oftentimes, with K2 that
17:31:53 there's other substances, it's not just K2 on its own.
17:31:56 And that's what a lot of studies have shown that there are
17:32:00 other substances, stimulants mixed with K2, which is why
17:32:05 it can contribute to hyperthermia. And there are reports
17:32:07 of K2 causing hyperthermia.
17:32:10 Q. For now, let's keep other substances out of it, okay?
17:32:13 Let's just do K2. You would not expect K2 if someone's in
17:32:17 air conditioning just taking the drug, no mode of
17:32:20 activity, just taking the drug, you would not expect heat
17:32:23 stroke temperatures of 106 from K2.
17:32:25 A. That a high temperature for K2.
17:32:27 Q. That's not what you'd expect, right?

17:32:28 A. Not expecting, but as we've seen before in these
17:32:31 other cases, we'd be surprised.
17:32:32 Q. Anything's possible but that's an unusual temperature
17:32:35 for K2 alone.
17:32:36 A. Yes.
17:32:43 Q. And Mr. Straway also had obesity and that's also a
17:32:56 potential heat sensitivity factor, right?
17:32:57 A. That's a potential.
17:33:01 Q. Let's talk about Ms. Armando Gonzales. "Ms." despite
17:33:08 the Armando, he identified as a woman. You understand?
17:33:11 A. That is correct.
17:33:12 Q. So thus, the "Ms." So I heard you talking about a
17:33:21 number of substances. You had mentioned -- I think there
17:33:27 was mentioned on some of the file materials of another
17:33:31 prisoner talking about on some other occasion, Effexor
17:33:37 diphenhydramine use?
17:33:38 A. Yes.
17:33:38 Q. None that was found on the tox report on the autopsy,
17:33:41 right?
17:33:41 A. No. And I think the issue with the tox report was
17:33:44 when they took the tox report, it wasn't very clear how
17:33:47 long after the tox report was taken.
17:33:50 Q. But what we have to go on is they found fentanyl and
17:33:57 Versed, right?
17:33:58 A. Midazolam.

17:33:59 Q. Fentanyl's a powerful opiate?
17:34:04 A. Yes.
17:34:05 Q. And Versed midazolam is a benzodiazepine.
17:34:10 A. You are correct.
17:34:11 Q. That's what was found on the tox report, right?
17:34:11 A. Correct.
17:34:12 Q. No diphenhydramine on the tox report, right?
17:34:15 A. None that I know.
17:34:15 Q. No Effexor on the tox report.
17:34:18 A. Well, actually, I'd have to double check the
17:34:19 toxicology report just to make sure that diphenhydramine,
17:34:23 but I believe it was low levels of concentrations. But
17:34:27 Effexor, I did not see that.
17:34:29 Q. So what you were wanting to take into account --
17:34:37 again, you're not doing cause or contribution of death.
17:34:40 The fact that you want to take into account is the fact as
17:34:44 you read the file that Ms. Gonzales had used the collapse
17:34:50 and death were primarily from fentanyl -- illicit fentanyl
17:34:55 and midazolam usage prior to collapse, right?
17:34:58 A. Correct, and that was reflected in the autopsy
17:35:00 findings that -- and why Dr. Uribe and I had the same
17:35:03 conclusion in our reports.
17:35:06 Q. Did you review Ms. Gonzales' medical records?
17:35:09 A. I reviewed the OIG records after my report.
17:35:13 Q. And again, you're here in court offering the opinion

17:35:17 that prior to collapse, that you want to highlight the
17:35:21 fact of illegal fentanyl and midazolam use, right?
17:35:23 A. Well, later on, I found out the midazolam was likely
17:35:27 given in the hospital, but according to the report,
17:35:30 fentanyl did not pop up as a medication that they provided
17:35:33 for Ms. Gonzales.
17:35:34 Q. Well, certainly then, you're going to withdraw your
17:35:37 opinion that midazolam had anything to do with the cause
17:35:40 of death if it was given in the hospital, right?
17:35:41 A. Correct. Yes.
17:35:42 Q. So now we're down to just fentanyl, but you continue
17:35:45 to maintain or you want to highlight the fact, based on
17:35:49 your reading of the file, that there was illicit fentanyl
17:35:51 use that caused collapse and death.
17:35:53 A. That is potential based on the --
17:35:56 Q. That's a fact to be considered. That's what your --
17:35:58 A. I think it's an important fact to consider because if
17:36:01 we look at the fentanyl concentrations, it was 4.4
17:36:05 nanograms per milliliter and anything about 3 nanograms
17:36:10 per milliliter is lethal.
17:36:13 Q. Are you aware that tox screens were done before Ms.
17:36:20 Gonzales went into the hospital or as she was going to
17:36:22 into the hospital?
17:36:23 A. I did read those reports.
17:36:24 Q. Okay. Let's take a look at them. Paul, 168C,

17:36:27 please. Page 82. I take it, you saw this, right?
17:36:44 A. Correct.
17:36:44 Q. There was a urine screen in connection with her going
17:36:48 into the emergency room, right?
17:36:50 A. Correct.
17:36:50 Q. We've already gotten rid of midazolam, the benzos.
17:36:55 We don't need to talk about that anymore.
17:36:56 A. Correct.
17:36:56 Q. Opiates. If there was fentanyl, it would be under
17:37:00 opiates, right?
17:37:00 A. That's correct.
17:37:01 Q. And on the urine drug screen, it was negative, right?
17:37:03 A. Correct.
17:37:05 Q. So that test indicates she didn't have fentanyl at
17:37:08 the time she went in the hospital, right?
17:37:10 A. Well, that test indicates that there wasn't fentanyl
17:37:13 present when that lab was drawn. If you scroll down, we
17:37:17 can look at the timing of the test and it was 2145 so on
17:37:25 8-21, I can't remember the specific time they found her,
17:37:28 but that's another important consideration is whether or
17:37:31 not fentanyl had been already metabolized by that time.
17:37:36 Q. How long would it take for fentanyl to metabolize and
17:37:41 be completely out of your system so that the urine drug
17:37:44 screen wouldn't pick it up?
17:37:45 A. It would take about day and a half.

17:37:47 Q. So August 21st, 2145 is the time of this urine drug
17:37:54 screen. Oh, before we leave this, Paul, would you also --
17:37:58 did you see any information about there also being a blood
17:38:02 draw?
17:38:02 A. The blood draw, I believe I saw that as well.
17:38:04 Q. Let's go to page 70. So this is one of the OIG
17:38:17 investigators looking to get information, right?
17:38:19 A. Yes.
17:38:19 Q. Right before the signature, the blood panel run at
17:38:24 admission to Baylor Scott & White was negative for
17:38:26 controlled substances, right?
17:38:27 A. That is correct.
17:38:28 Q. So we also got a blood test even more accurate,
17:38:31 right?
17:38:32 A. Correct.
17:38:32 Q. Okay. So now let's take a look at what time she was
17:38:37 found down. Paul, if you'd go to 168B, please. Found
17:38:58 down -- patient was found down in her cell at 1954 on
17:39:04 8-21-23, less than two hours before the urine drug screen.
17:39:09 Lot less than a day and a half, right?
17:39:10 A. That's correct.
17:39:11 Q. Do you think we could be pretty confident or
17:39:14 certainly more likely than not that fentanyl wasn't in her
17:39:16 system when she went into the hospital, fair?
17:39:18 A. I think the troubling thing to wrap my head around is

17:39:21 the fact that the hospital also admitted that they did not
17:39:24 give fentanyl. So the question that we have to ask is
17:39:26 where did the fentanyl come from.
17:39:28 Q. She was intubated in the hospital, right?
17:39:30 A. Yes.
17:39:30 Q. Now, I know you're not a clinician or an emergency
17:39:33 room physician.
17:39:33 A. Correct.
17:39:34 Q. So you might not be aware that fentanyl is often used
17:39:36 in conjunction with intubation or are you?
17:39:38 A. No. I'm aware. But they specifically also noted
17:39:42 that fentanyl was not administered so that's why -- and it
17:39:46 was also the fact that fentanyl was above the lethal
17:39:50 threshold is why I made that clinical finding to keep that
17:39:54 in mind as well because it was way past the lethal
17:39:57 threshold if you were to give fentanyl, it would not be
17:40:01 that high. So that's where there was conflicting reports.
17:40:06 Q. Okay. But what we have is both a urine and a blood
17:40:09 test at a time when fentanyl would have still have been in
17:40:13 her system but negative, right?
17:40:14 A. Correct. Another import -- yeah. That's correct.
17:40:36 Q. So you were talking about your tox reports you get at
17:40:38 the VA, right?
17:40:39 A. Correct.
17:40:40 Q. The medical providers that we're talking about for

17:40:44 these folks here today in connection with the healthcare
17:40:47 for these TDCJ inmates is through University of Texas
17:40:50 Medical Branch?
17:40:51 A. I believe so.
17:40:52 Q. You're familiar with UTMB generally?
17:40:54 A. I am.
17:40:55 Q. You'd expect they could get a tox report back way
17:40:58 earlier than eight months, right?
17:40:59 A. I hope so.
17:41:00 Q. You would expect so.
17:41:02 A. I would really hope so, yes.
17:41:04 Q. Right. Seems a bit odd that it took eight months,
17:41:08 right?
17:41:08 A. I can't opine on the amount of delays that are -- I
17:41:11 don't know how many other hospitals or institutions also
17:41:14 use them for toxicology.
17:41:15 Q. Fair enough. We won't hold you to being an expert in
17:41:19 UTMB.
17:41:24 A. Thank you.
17:41:24 Q. Okay. I want to talk to you about the heat score.
17:41:32 You were in the court when Dr. Leonardson testified this
17:41:37 morning?
17:41:37 A. Yes. Correct.
17:41:37 Q. And I think you may have discussed this at your
17:41:38 deposition, the ambient heat score that's used to generate

17:41:42 a heat score for TDCJ prisoners?
17:41:45 A. Yes.
17:41:45 Q. Are you familiar with that?
17:41:45 A. Yes, I did review that as a document.
17:41:47 Q. Let's go ahead and put that up. Paul, it's
17:41:51 Plaintiffs' 329. This is the latest version, just couple
17:42:10 of months ago. It's your understanding, this is the
17:42:12 current version of what's called the at-hand heat score?
17:42:16 A. That's correct.
17:42:17 Q. You understand from hearing Dr. Leonardson's
17:42:19 testimony, there's an initial intake one but then, this
17:42:23 one is used for the ongoing heat scores for the inmates,
17:42:25 right?
17:42:25 A. That's correct.
17:42:27 Q. Okay. You see how it's divided into only if over age
17:42:34 65 and thus, the stuff up at the top is only if you're
17:42:37 younger than 65?
17:42:38 A. I see that.
17:42:39 Q. We've talked about some conditions in comorbidities
17:42:44 that make you -- as well as medications that have
17:42:48 potential to make you heat sensitive, right?
17:42:50 A. That's correct.
17:42:51 Q. A lot of these things are missing off of this heat
17:42:56 score, aren't they?
17:42:57 A. Well, I'm not here to opine on the heat score.

17:43:00 Q. Well, you do know a lot about drugs that could
17:43:03 potentially make you heat sensitive, right?
17:43:05 A. That's correct.
17:43:05 Q. So let's limit ourselves to that piece of it.
17:43:09 Because one of the categories is medication, right?
17:43:12 A. I see that.
17:43:15 Q. So all we're going to talk about is whether there is
17:43:18 missing any drugs that you know to have the potential for
17:43:22 heat sensitive -- that's well within your bailiwick which
17:43:25 drugs those are, right?
17:43:25 A. Sure.
17:43:26 Q. The only medication listed -- above that are all
17:43:28 conditions but the only medication listed is on any HAAC
17:43:35 prescription for four days or more, right?
17:43:36 A. I see that.
17:43:37 Q. And you may have seen this. Before when you go to
17:43:39 the bottom, see the asterisk, it defines that as a highly
17:43:43 active anticholinergic prescription, right?
17:43:46 A. I see that.
17:43:48 Q. Now, that's the only standalone medication listed.
17:43:52 We've done a whole a lot of talking about other
17:43:55 medications that have the potential to make you heat
17:43:58 sensitive, right?
17:43:59 A. Correct.
17:44:00 Q. All those drugs should be on this heat score list,

17:44:03 shouldn't they?
17:44:03 A. That's not correct. Like I said before,
17:44:06 anticholinergic side effects are a spectrum and so, just
17:44:10 because a medication has anticholinergic properties,
17:44:13 mechanism does not equal inevitability doesn't mean that
17:44:16 our individual patients are going to have thermoregulatory
17:44:19 impact. So not all medication with anticholinergic
17:44:22 effects should be included. It's not clinically relevant.
17:44:26 Q. You just used the word "inevitable" and I don't think
17:44:30 anyone here is talking about knowing something is
17:44:32 inevitable. I think we're talking about drugs with the
17:44:34 potential to cause heat sensitivity and if we're talking
17:44:38 about drugs with the potential to cause heat sensitivity,
17:44:40 we've got a bunch that are missing, right?
17:44:42 A. If we're talking about potential?
17:44:43 Q. Yeah.
17:44:44 A. Yeah, there could be potentially medication missing,
17:44:47 depending on what's on the list.
17:44:49 Q. Well, the only medication on this heat score is
17:44:52 highly active anticholinergic drugs, right?
17:44:54 A. I see that.
17:44:55 Q. Okay. So first of all, this should be right in your
17:45:00 bailiwick, I would imagine. In pharmacy Ph.D.s in your
17:45:04 world, is there a generally accepted definition of highly
17:45:07 active anticholinergic drug?

17:45:09 A. I can say that I've never seen that acronym before in
17:45:13 that specific category. There are medications that have
17:45:16 more anticholinergic properties, but an HAAC category, I'm
17:45:22 not familiar with that. But there are, like I said,
17:45:25 medications that may potentially pose a higher risk than
17:45:30 others.
17:45:30 Q. Got it. But that term itself, that's not one that
17:45:33 out in the pharmacy expert world gets used. So you can't
17:45:36 say, well, I know these ones are in and these ones are
17:45:38 out, right?
17:45:39 A. Correct.
17:45:39 Q. Okay. Paul, let's go to Plaintiffs' 333. We've
17:45:48 talked about a number of drugs. I think you may have
17:45:50 looked at this on your direct examination, right?
17:45:54 A. I believe so, yes.
17:45:57 Q. Yeah. And so, this is from the -- there's a bunch of
17:46:00 Correctional Managed Healthcare policies and those are
17:46:02 policies that govern healthcare for TDCJ inmates that are
17:46:07 done between TDCJ and the medical partners, right?
17:46:08 A. Correct.
17:46:09 Q. It's your understanding?
17:46:11 A. Yes.
17:46:12 Q. And it's Policy D72, it's an Attachment A to Policy
17:46:22 D27.2. And you've reviewed this. You talked it on your
17:46:26 direct examination?

17:46:26 A. Correct.
17:46:27 Q. And so, these are the drugs associated with heat
17:46:32 stress. This is the list that the healthcare policy
17:46:38 manual for TDCJ inmates say are drugs associated with heat
17:46:42 stress, right?
17:46:43 A. That's what the title says, yes.
17:46:46 Q. Every single one of those drugs ought to be on the
17:46:49 heat score when we're talking about drugs with the
17:46:51 potential to cause heat stress, right?
17:46:53 A. I'm not here to opine on the heat score. That is
17:46:58 outside of my areas of expertise. But again, to answer
17:47:01 your question, drugs have variability in terms of
17:47:05 thermoregulatory impacts and acetylcholine impacts.
17:47:09 Q. What is within your area of expertise -- forget the
17:47:13 heat score -- is what drugs have the potential to cause
17:47:15 heat stress or sensitivity and all the drugs on this list
17:47:18 have the potential to cause heat stress or sensitivity to
17:47:21 some degree, right?
17:47:21 A. To some degree, yes.
17:47:23 Q. If you'd blow it up a little bit for me. So we see
17:47:31 there are categories for beta blockers and calcium channel
17:47:37 blockers?
17:47:37 A. Correct.
17:47:37 Q. One calcium channel blocker's listed, right?
17:47:41 A. Correct.

17:47:41 Q. Is that the only calcium channel blocker that there
17:47:45 is or are there more?
17:47:46 A. No. There's a lot more.
17:47:47 Q. You'd agree with me that all the calcium channel
17:47:50 blockers should be listed as the potential to cause heat
17:47:53 sensitivity, right?
17:47:53 A. I don't know if I agree with that statement.
17:47:57 Q. Should there be more than one?
17:48:00 A. I would have to go back and look at the differences
17:48:02 between the calcium channel blockers. We have
17:48:05 dihydropyridine calcium channel blockers. We have
17:48:08 nondihydropyridine channel blockers. Each individual
17:48:11 calcium channel blocker has its own heat-related
17:48:15 instances, I assume, and whatever they decided for
17:48:18 amlodipine, I'd have to go back and look more
17:48:22 specifically. But to my knowledge, amlodipine calcium
17:48:25 channel blockers in general do not impact acetylcholine
17:48:30 and, if anything, they could potentially decrease the risk
17:48:34 of sweating that's based on the vasodilation mechanism.
17:48:39 Q. They're not the biggest heat stress drugs ever is
17:48:42 what you're trying to tell us?
17:48:44 A. They have a low risk, yes.
17:48:45 Q. Okay. But they do have a risk.
17:48:47 A. Potential risk.
17:48:49 Q. Let me run briefly through some conditions I think

17:49:09 that you discussed at your deposition that all have the
17:49:12 potential to cause heat sensitivity. These are the
17:49:15 comorbidities. Age one of them?
17:49:16 A. Correct.
17:49:16 Q. Mental illness?
17:49:17 A. To a certain extent.
17:49:19 Q. Obesity?
17:49:20 A. To a certain extent.
17:49:22 Q. Diabetes?
17:49:22 A. To a certain extent.
17:49:24 Q. Cardiovascular disease?
17:49:25 A. To a certain extent.
17:49:27 Q. Okay. And again, just to summarize, you've been here
17:49:32 to talk about your knowledge of drugs and things that you
17:49:34 think should be taken into consideration in considering
17:49:36 these patient deaths, but you have not and are not going
17:49:44 to offer an opinion about the cause of death and what did
17:49:47 or didn't cause any patient's death, heat, drugs or
17:49:50 anything else.
17:49:50 A. That's correct.
17:49:51 Q. All right. Thank you very much, Doctor. I'll pass
17:49:53 the witness.
17:49:56 MS. CARTER: Your Honor.
17:49:59 THE COURT: Followup? All right. Very good.
17:50:00 Thank you very much. You're free to go.

17:50:01 THE WITNESS: Thank you.
17:50:02 MS. CARTER: Your Honor, I said I do have --
17:50:04 THE COURT: Oh, I'm sorry. I thought I heard --
17:50:07 I'm sorry. My bad.
17:50:08 RE-DIRECT EXAMINATION
17:50:08 BY MS. CARTER:
17:50:16 Q. Dr. Vassallo -- I'm not going to be asking you about
17:50:19 this. Opposing counsel asked you many different questions
17:50:21 about drugs. You recall that?
17:50:23 A. Yes.
17:50:23 Q. Would you agree that considering all options is an
17:50:29 important decision in deciding mortality levels and
17:50:32 mortality rates in certain conditions?
17:50:34 A. Yes. I would agree. There's a lot of factors that
17:50:36 need to be considered.
17:50:37 Q. And you weren't here earlier in the week when Dr.
17:50:41 Vassallo admitted she did not take those into account,
17:50:44 were you?
17:50:44 A. I did not hear Dr. Vassallo's testimony.
17:50:46 Q. But you did read her report?
17:50:49 A. I'm sorry. Can you repeat?
17:50:51 Q. You saw that Dr. Vassallo and Dr. Uribe failed to
17:50:53 take those very same drugs into account in their opinions?
17:50:56 A. Yes, that is correct, in their reports.
17:50:58 Q. Nothing further, your Honor.

17:50:59 THE COURT: Thank you.
17:51:01 MR. SINGLEY: Nothing further, your Honor.
17:51:02 THE COURT: All right. Now you can go.
17:51:04 THE WITNESS: Thanks so much.
17:51:05 THE COURT: All right. That takes us to the end
17:51:06 of our day. Thank you very much for your hard work today.
17:51:11 We will hit the ground running tomorrow morning. What
17:51:15 does tomorrow look like? We'll start with the video?
17:51:22 MR. JOHNSON: Two videos.
17:51:24 THE COURT: Okay. Very good. Anything we need
17:51:25 to talk about before we break?
17:51:25 MR. KERCHER: Yes, your Honor. And we've not had
17:51:27 an opportunity to confer with plaintiffs' counsel. We
17:51:30 wanted to put this on the record, though, as we go into
17:51:33 discussions because I expect that it'll be controversial.
17:51:36 As the Court knows, we have -- defense turned over some
17:51:40 530 death records over the course of this case. We didn't
17:51:42 always agree that they were relevant. Some of those were
17:51:45 NACs. Some of those had to do with cancer. We turned
17:51:48 over hundreds of them. And the Court will remember when
17:51:50 we got another autopsy here during trial that they asked
17:51:55 for specifically last week, we turned it over.
17:51:57 We got a request today for an update regarding
17:52:01 some ongoing requests to which we have been responding
17:52:04 since after the close of discovery. Discovery closed

17:52:09 mid-October. Mid-December following MSJ briefing,
17:52:13 plaintiffs asked us for death records concerning an
17:52:17 additional 50-plus inmates. Their position is and was, I
17:52:20 think, that that would be supplemental information. We
17:52:23 disagree that it is supplemental. We have nevertheless
17:52:26 endeavored over the subsequent months to provide updates
17:52:31 on those.
17:52:32 The last time the parties discussed it was, I
17:52:34 believe, February 19th and we turned over to them what we
17:52:36 had at the time. Today, we got a new request from
17:52:40 plaintiffs' counsel asking what about these 15 remaining
17:52:44 names on that list. We have inquired. It turns out that
17:52:47 we have autopsies for 12 of those now.
17:52:50 Our concern at this point is that we are two days
17:52:53 from the end of trial and, at some point, that the
17:52:57 discovery must stop so that the trial can be final. I
17:53:01 have not looked at the reports. I don't know what they
17:53:02 say. I don't know if they're good for my case or if
17:53:04 they're bad for my case. If the Court would like to
17:53:06 review them in camera, that's something we're willing to
17:53:09 discuss.
17:53:10 But what we don't think would be appropriate,
17:53:12 particularly since we have all worked very hard to get to
17:53:16 trial on a speedy schedule, would be to introduce 12 new
17:53:20 autopsies and then, have all these experts retake the

17:53:24 stand. I don't know exactly the best way to handle that.
17:53:27 We will discuss when we get the opportunity to confer with
17:53:30 plaintiffs' counsel, but I want to let everybody know as
17:53:32 soon as we know that we have these autopsy reports we did
17:53:35 not have previously and I think we're going to have a
17:53:37 disagreement about them.
17:53:38 THE COURT: Okay. Well, let's see if you're
17:53:40 going to have a disagreement before I get involved unless
17:53:44 you want to add something.
17:53:46 MR. HOMIAK: Yes, your Honor. Certainly, we
17:53:47 don't know -- this is news to us. We didn't know that
17:53:50 there were going to be more autopsy reports. The purpose
17:53:52 for sending the e-mail was to confirm that the same list
17:53:54 we've now been talking about for several months, which was
17:53:58 confirmed by Mr. Echessa submitting that the day he was in
17:54:01 court saying that there were no deaths in 2025. We have
17:54:05 been talking about the same list of deaths now for about
17:54:07 four months.
17:54:07 The only reason for sending the e-mail today was
17:54:09 not that we expected to get any autopsy reports; it's that
17:54:13 we were confirming that there were no autopsy reports
17:54:15 issued. So we did not expect that there was going to be
17:54:17 any update. We just wanted to make sure that that was
17:54:19 still accurate to the extent that that was a data point
17:54:22 covered with Dr. Felicella tomorrow.

17:54:26 THE COURT: I was going to ask if it's your
17:54:28 position that those reports were responsive to discovery
17:54:33 requests and would be categorized as you anticipate as
17:54:37 being supplemental.
17:54:38 MR. HOMIAK: No, your Honor. It's our position
17:54:40 that because of Mr. Echessa's affidavit where he said
17:54:44 there were no deaths in 2025, that's really what started
17:54:47 this conversation we've been having for the last three
17:54:48 months. But it's certainly not going to be our position
17:54:51 that the autopsy reports lead to reopening witnesses or
17:54:54 having any other witnesses testify. As much as I'd love
17:54:57 to see those autopsy reports today, I don't want to take
17:54:59 the Court's time, everybody else's time to bring back
17:55:02 those witnesses. I think it does lead to a slightly more
17:55:04 complicated question, which is how we address that with
17:55:06 Dr. Felicella because I think one of the questions we had
17:55:09 for her -- I don't want to put words into the attorney's
17:55:12 mouth who's planning on examining her is why it took so
17:55:16 long for these 55 autopsy reports to be done. But that
17:55:18 was the limited purpose of confirming that information.
17:55:21 It wasn't to get the reports themselves.
17:55:22 And so, it may be that we just -- we have an
17:55:26 agreement on the record that there have been 13 autopsy
17:55:29 reports issued. To the extent that we can get the dates
17:55:31 that they were issued, that's all we need rather than the

17:55:35 autopsy reports themselves. I certainly don't want to
17:55:38 bring in -- I want to be abundantly clear we don't want to
17:55:40 bring in any other witnesses and prolong this trial. But
17:55:43 I appreciate defense counsel letting us know that those
17:55:46 reports came in today.
17:55:47 THE COURT: I'm glad you raised that issue so
17:55:48 that -- it sounds like you can get together and resolve
17:55:52 this without my needing to get involved but if it does --
17:55:55 MR. KERCHER: That's why I wonder whether there
17:55:57 might be more than one opinion over there, but we will
17:55:59 report back and get the opportunity to confer.
17:56:02 THE COURT: That sounds great. Thank you very
17:56:04 much. Anything else? Okay. We will be in recess until
17:56:08 9:30 tomorrow morning. Thank you very much.
(Proceedings adjourned.)

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UNITED STATES DISTRICT COURT)
WESTERN DISTRICT OF TEXAS)

I, LILY I. REZNIK, Certified Realtime Reporter, Registered Merit Reporter, in my capacity as Official Court Reporter of the United States District Court, Western District of Texas, do certify that the foregoing is a correct transcript from the record of proceedings in the above-entitled matter.

I certify that the transcript fees and format comply with those prescribed by the Court and Judicial Conference of the United States.

WITNESS MY OFFICIAL HAND this the 4th day of May, 2026.

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